

Alberta Environment and Parks (AEP)
Air.Reporting@gov.ab.ca

May 2, 2018

Subject: Monthly Report Submission for the LICA Cold Lake South station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Cold Lake South AQM Station in the month of March 2018.

The air monitoring program consists of continuous air monitoring, passive sampling, intermittent sampling, including both VOC and PAH sampling program, and Partisol sampling program. All the air monitoring activities were conducted by contractors.

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
Passive	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics
Intermittent	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable
VOC Canister	Maxxam Analytics	InnoTech Alberta Inc	InnoTech Alberta Inc	Not Applicable

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

All data collected in March 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

THC: The LICA-owned zero-air generator (s/n: 4027) was removed for required maintenance and was replaced with another LICA-owned unit (s/n: 1812) on March 20.

A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The audit report can be found in this monthly report.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also verify all air data that are required by the AMD to be electronically submitted to AEP and Alberta’s Ambient Air Quality Data Warehouse have been submitted by the time of this report submission, with the exception of electronic submission for the results of intermittent samples and VOC canister samples. We are currently working with the airdata warehouse to set up codes for some VOC/PAH species that are missing in the parameter list. The results for these data will be submitted once all needed codes are available.



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Should you have any questions, please don't hesitate to contact us.

Respectfully,

A handwritten signature in blue ink that reads "Michael Bisaga". The signature is written in a cursive style with a large, prominent initial "M".

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A handwritten signature in blue ink that reads "Lily Lin". The signature is written in a cursive style with a large, prominent initial "L".

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AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
COLD LAKE SOUTH CONTINUOUS MONITORING STATION

JOB #: 2833-2018-03-1-C

March 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
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Attention: MIKE BISAGA

DATE: **April 30, 2018**

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SUMMARY

In March 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Cold Lake Continuous Monitoring Station, near Cold Lake, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry & Community Association.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

THC: On March 20, the LICA-owned zero-air generator (s/n: 4027) was removed for required maintenance and was replaced with another LICA-owned unit (s/n: 1812). Between March 21 and 23 unstable zero responses were recorded due to contaminated zero air. The technician fixed the loose contact wire causing the valve to switch between zero phase and sample position. Additional zero-span response checks were initiated to assess the response, resulting in four hours of downtime.

A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The Audit report can be found in Appendix III.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association, Cold Lake South Continuous Monitoring Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
Cold Lake South Continuous Monitoring Station						1-HOUR					24-HOUR		
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0	2	7	10	4.6	WSW	1	8	100.0
TRS (ppb)	-	-	-	-	0	1	12	7	0.8	SSE	0	1	100.0
THC (ppm)	-	-	-	-	2.24	3.38	8	9	2.6	ENE	2.63	13	99.5
NO ₂ (ppb)	159	-	0	-	5	36	14	6	3.5	E	15	13	100.0
NO (ppb)	-	-	-	-	1	52	12	7	0.8	SSE	6	12	100.0
NO _x (ppb)	-	-	-	-	6	87	12	7	0.8	SSE	18	12	100.0
O ₃ (ppb)	82	-	0	-	36.5	58.8	13	16	3.4	ENE	44.8	20	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	5	29	20	8	3.1	SSW	14	20	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-6.3	8.8	11	15	5.3	WSW	-0.6	14	100.0
VECTOR WS (kph)	-	-	-	-	1.7	18.9	31	16	-	WSW	13.3	3	100.0
VECTOR WD (sec)	-	-	-	-	83 (E)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

NO₂ 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

PM_{2.5} 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

PM_{2.5} 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O₃ 1-Hour Exceedances

Measured concentrations of ozone were below the 1-hour AAAQO of 82 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Total Reduced Sulphur (TRS), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The Audit report can be found in Appendix III.
- The routine monthly calibration was performed on March 19.
- One instance of maximum instantaneous data was discarded on March 26 at hour 09:00, due to a brief power outage.

TOTAL REDUCED SULPHUR (TRS)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The Audit report can be found in Appendix III.
- The routine monthly calibration was performed on March 19.
- One instance of maximum instantaneous data was discarded on March 26 at hour 09:00, due to a brief power outage.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 99.5%, equivalent to four hours of downtime.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The Audit report can be found in Appendix III.
- A shut-down calibration was performed on March 20 to replace LICA's zero air generator (s/n: 4027) with another LICA zero air generator (s/n: 1812), as the purge valve and filter holder required maintenance. A post-repair calibration was performed following the swap.
- Between March 21 and March 23, instability in zero response was observed. A technician was onsite on March 23 and observed a loose contact wire which caused unstable zero responses, evidenced in the fluctuating minute data. The valve was switching from zero phase to sample position during the daily zero-span check allowing ambient air to contaminate the zero air. The technician rebuilt the connector which corrected the valve problem and in turn resolved the fluctuating minute data issue. Single-phase zero checks were performed on March 23 at hours 10:00-11:00, March 24 at hours 12:00 and 20:00, as well as a repeat zero-span check on March 24 at hour 14:00 in response to the abrupt zero drifts. The calibration program was also modified remotely during the trouble-shooting efforts on March 24. Four hours of downtime were recorded as a result of these corrective actions.
- A discrepancy in the March 25 daily zero-span results between the analyzer and data logger was observed during a site visit on March 26. The March 25 results recorded on the data logger indicated the span failed. However, when the technician observed the zero-span results directly from the analyzer they were within AMD acceptance criteria. Upon investigation, a wiring issue was discovered which impacted the datalogger output. Once the wiring was corrected, the zero-span discrepancy was resolved.
- Elevated zero response was observed throughout the month, however it was more marked between March 21-31. The adjusted zero obtained from the post-repair calibration on March 20 was applied for baseline correction on data collected from March 20 at hour 15:00 to March 31 at hour 23:00. Although the daily zero check results met the AMD requirements, they were elevated, and would have skewed ambient concentrations after applying zero correction. The adjusted zero was therefore applied for baseline correction on data.
- Two instances of maximum instantaneous data were discarded on March 14 at hour 07:00 and March 26 at hour 09:00, due to brief power outages.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The Audit report can be found in Appendix III.
- The routine monthly calibration was performed on March 19.
- One instance of maximum instantaneous data was discarded on March 26 at hour 09:00, due to a brief power outage.

OZONE (O₃)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The Audit report can be found in Appendix III.
- The routine monthly calibration was performed on March 20.
- Two instances of maximum instantaneous data were discarded on March 14 at hour 07:00 and March 26 at hour 09:00, due to brief power outages.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The Audit report can be found in Appendix III.
- The routine monthly audit was performed on March 26.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The Audit report can be found in Appendix III.
- Two instances of maximum instantaneous data were discarded on March 14 at hour 07:00 and March 26 at hour 09:00, due to brief power outages.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The Audit report can be found in Appendix III.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 14. The Audit report can be found in Appendix III.

2.0 Project Personnel

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
Maxxam AIR SOP-00212: Ambient O₃ Monitoring
Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
MET One Instruments: Operation Manual Document No. 50.5-9800

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - Thermo 43i UV Fluorescent Analyzer
Total Reduced Sulphur - Thermo 450i UV Fluorescent Analyzer
Total Hydrocarbons - Thermo 51C FID Analyzer
Oxides of Nitrogen - Thermo 42i Chemiluminescent Analyzer
Ozone - Thermo 49i Photometric Analyzer
Particulate Matter (PM_{2.5}) - Thermo SHARP 5030 Unit
Wind System - Met One Unit
Relative Humidity - Met One Unit
Ambient Temperature - Met One Unit
Datalogger - ESC 8832

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

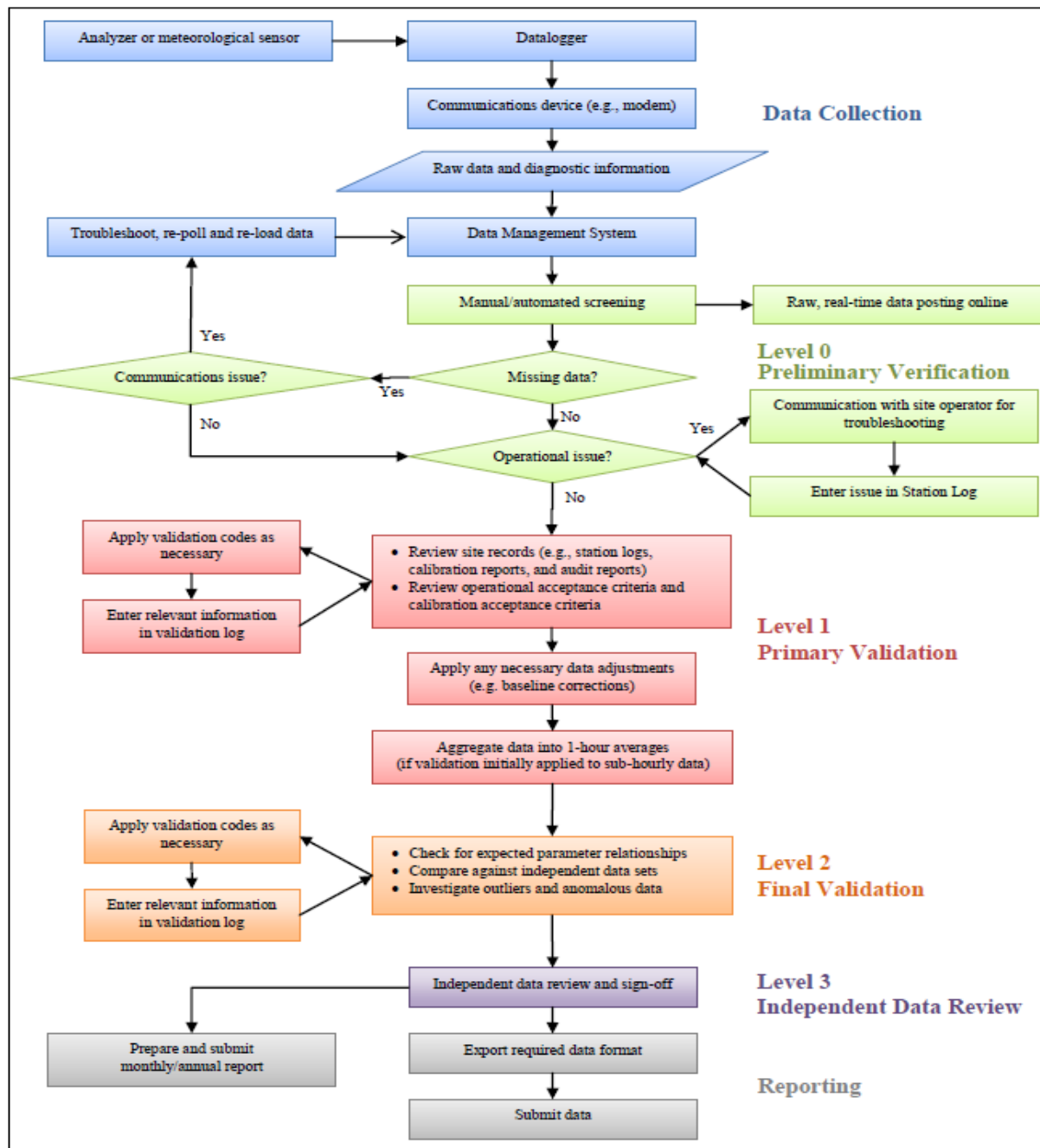
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

Table with 28 columns for hourly SO2 readings (0:00 to 23:00), 3 columns for daily/24-hr averages (DAILY MIN, DAILY MAX, 24-HR AVG), and 1 column for RDGS. Rows represent days 1 through 31. Includes status flags like S, Q, C, X, G, P.

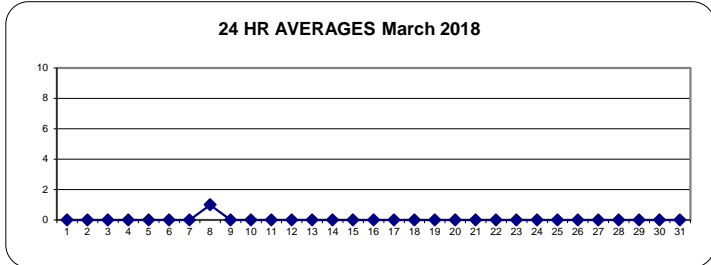
STATUS FLAG CODES

Legend for status flag codes: C - MONTHLY CALIBRATION, C1 - REPEAT CALIBRATION, Y - MAINTENANCE, S - DAILY ZERO/SPAN CHECK, S1 - REPEAT ZERO/SPAN CHECK, Q - QUALITY ASSURANCE, R - RECOVERY, X - MACHINE MALFUNCTION, G - OUT FOR REPAIR, P - POWER FAILURE.

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 172 ppb, 24-HR 48 ppb

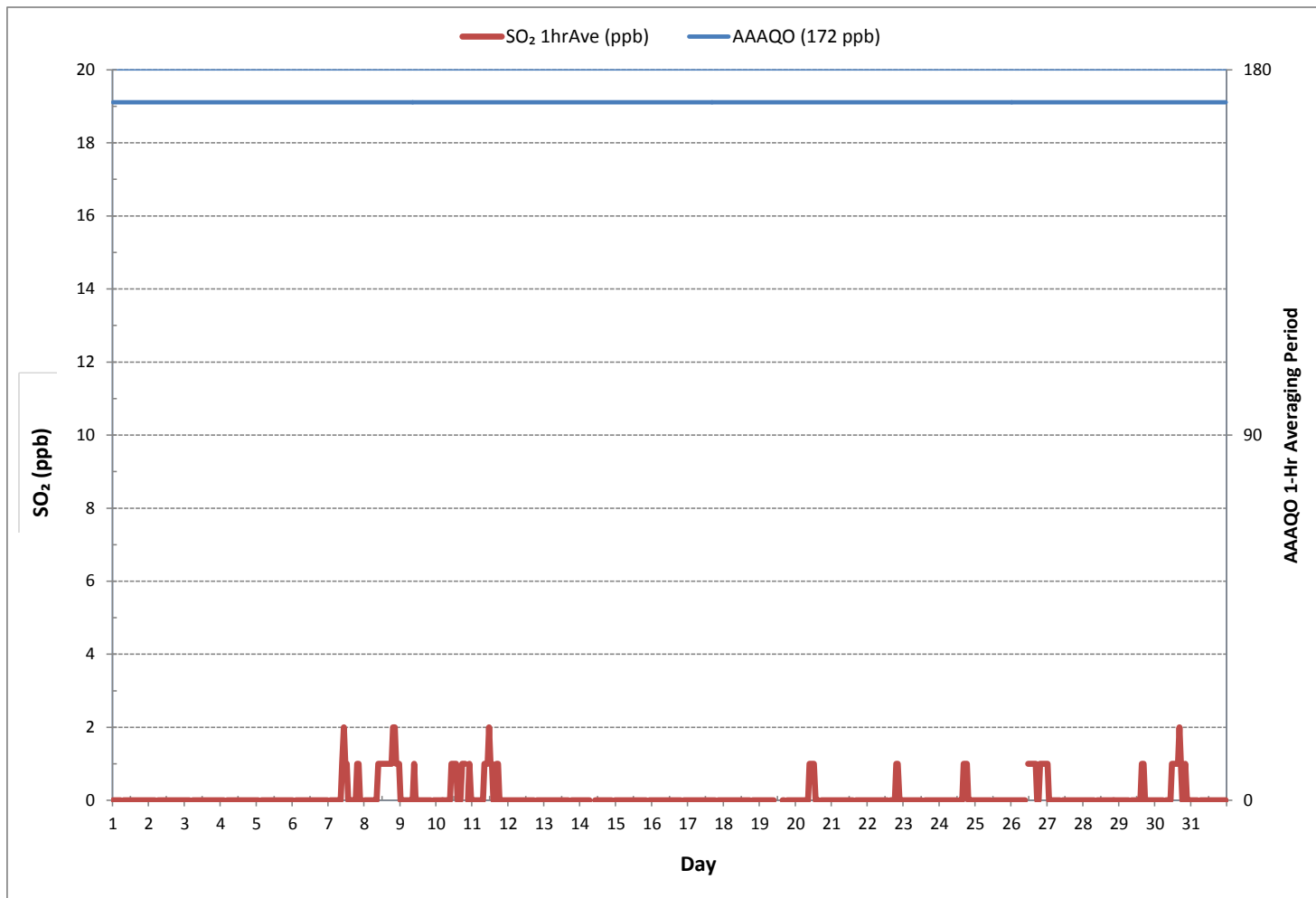
24 HR AVERAGES March 2018



MONTHLY SUMMARY

Summary table with 2 columns: Metric and Value. Includes: NUMBER OF 1-HR EXCEEDANCES: 0, NUMBER OF 24-HR EXCEEDANCES: 0, NUMBER OF NON-ZERO READINGS: 68, MINIMUM 1-HR AVERAGE: 0 ppb @ HOUR, MAXIMUM 1-HR AVERAGE: 2 ppb @ HOUR, MAXIMUM 24-HR AVERAGE: 1 ppb, IZS CALIBRATION TIME: 32 hrs, MONTHLY CALIBRATION TIME: 5 hrs, STANDARD DEVIATION: 0, OPERATIONAL TIME: 744 hrs, AMD OPERATION UPTIME: 100.0 %, MONTHLY AVERAGE: 0 ppb.

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-SO2[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.23%

Calm Avg: 0.10 [ppb]

Direction	0.0-0.6	0.6-1.2	1.2-1.8	1.8-2.4	2.4-3.0	>3.0	Total
N	3.6	0.4	0.4	0.0	0.0	0.0	4.4
NE	18.2	0.9	0.1	0.0	0.0	0.0	19.2
E	21.7	0.4	0.1	0.0	0.0	0.0	22.2
SE	7.3	0.1	0.3	0.1	0.0	0.0	7.8
S	1.7	0.0	0.0	0.0	0.0	0.0	1.7
SW	10.4	2.7	0.3	0.0	0.0	0.0	13.4
W	8.6	0.1	0.1	0.0	0.0	0.0	8.8
NW	3.1	0.7	0.1	0.1	0.0	0.0	4.1
Summary	74.5	5.4	1.6	0.3	0.0	0.0	81.7

% Icon Classes (ppb)

74 0.0-0.6

5 0.6-1.2

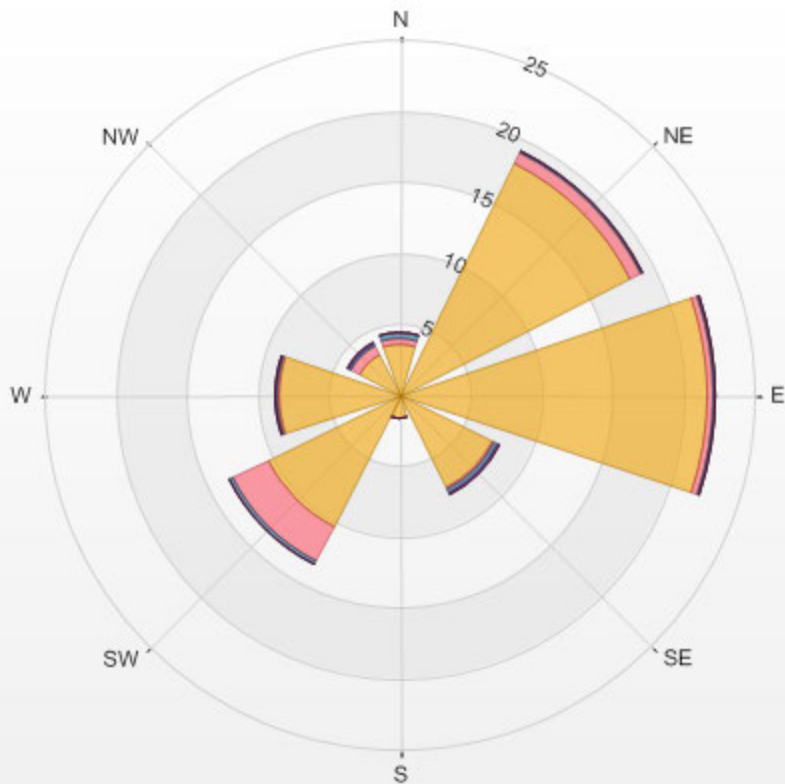
2 1.2-1.8

0 1.8-2.4

0 2.4-3.0

0 >3.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-SO2[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 18.23% Calm Poll Avg: 0.10 [ppb]



SO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL REDUCED SULPHUR

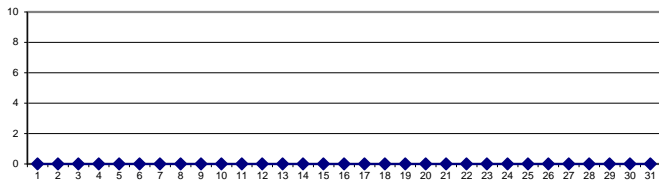
TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
2	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
3	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
4	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
5	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
6	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
7	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	24	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
12	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24	
14	0	0	0	0	0	0	0	0	Q	Q	Q	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24	
19	0	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
28	0	0	0	0	0	0	0	1	0	S	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
29	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
30	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
31	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
HOURLY MAX	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

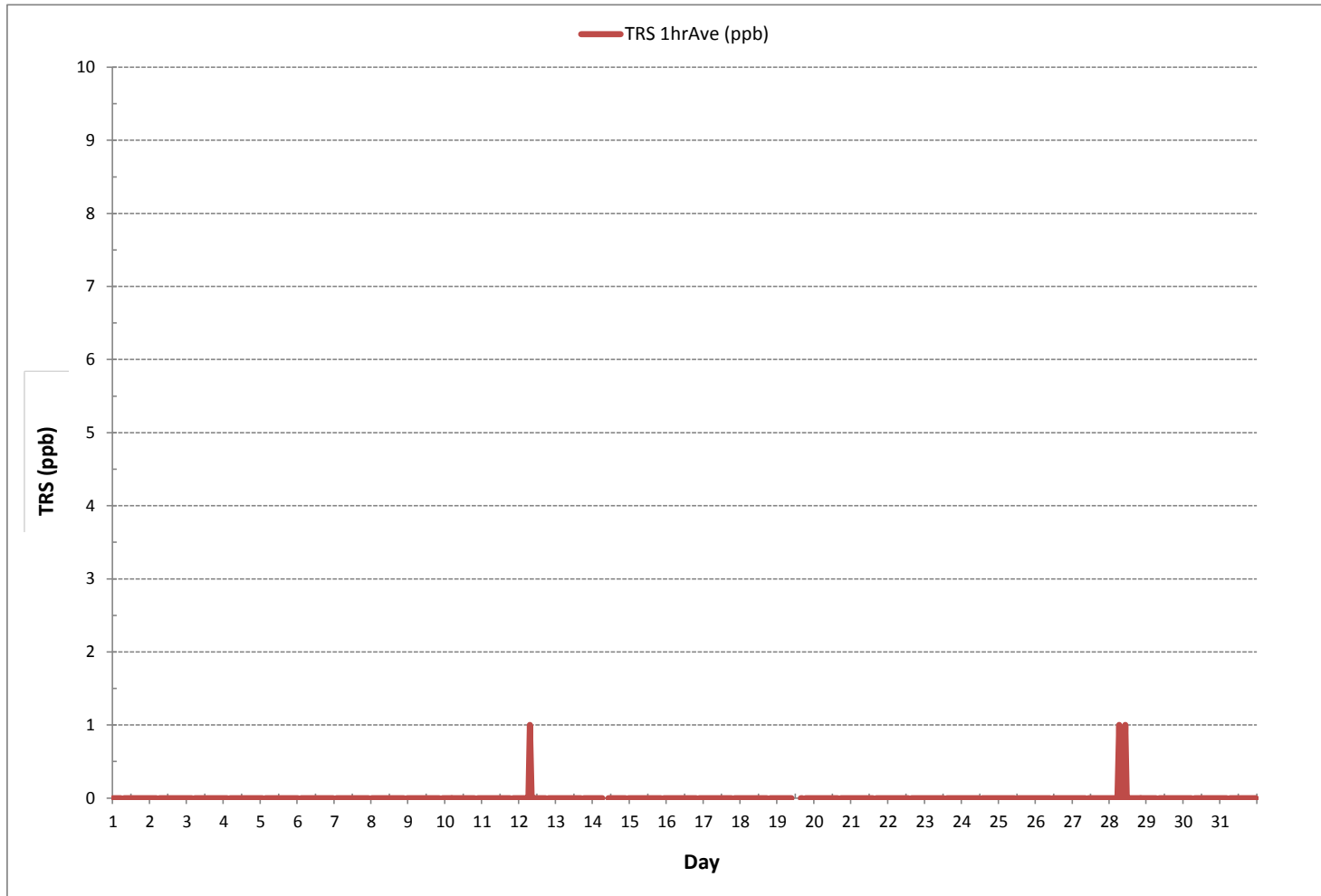
24 HR AVERAGES March 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	3			
MINIMUM 1-HR AVERAGE:	0	ppb @ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	1	ppb @ HOUR	7	ON DAY 12
MAXIMUM 24-HR AVERAGE:	0	ppb		ON DAY 1
IZS CALIBRATION TIME:	32	hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0 ppb

TOTAL REDUCED SULPHUR Hourly Averages (TRS ppb)



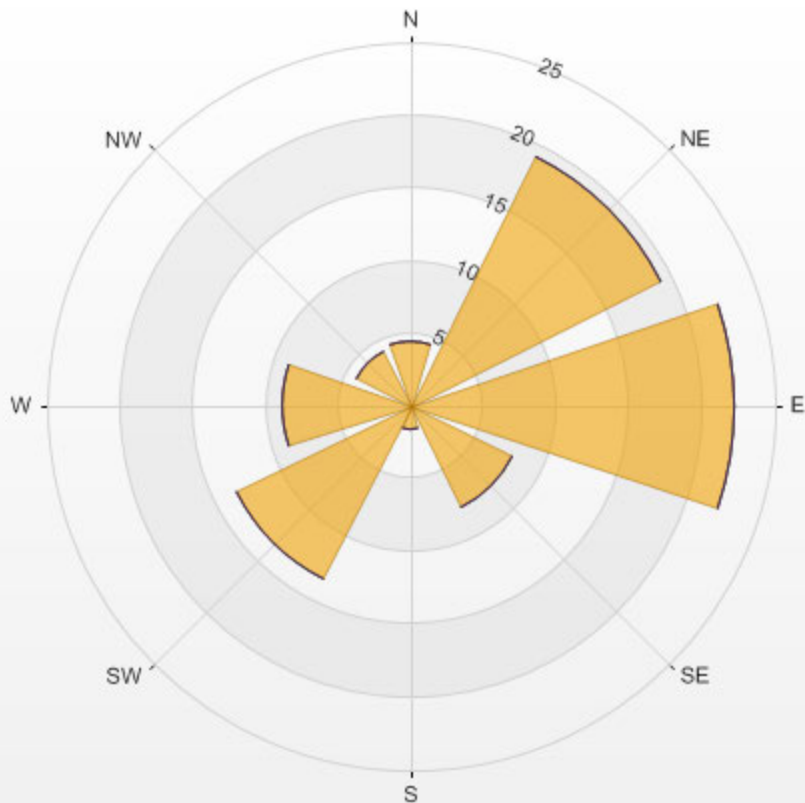
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-TRS[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.23% Calm Avg: 0.28 [ppb]

Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	4.4	0.0	0.0	0.0	4.4
NE	19.2	0.0	0.0	0.0	19.2
E	22.2	0.0	0.0	0.0	22.2
SE	7.8	0.0	0.0	0.0	7.8
S	1.7	0.0	0.0	0.0	1.7
SW	13.4	0.0	0.0	0.0	13.4
W	8.8	0.0	0.0	0.0	8.8
NW	4.1	0.0	0.0	0.0	4.1
Summary	81.8	0.0	0.0	0.0	81.8

% Icon Classes (ppb) 82 0.0-0.7 0 0.7-1.3 0 1.3-2.0 0 >2.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-TRS[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 18.23% Calm Poll Avg: 0.28[ppb]



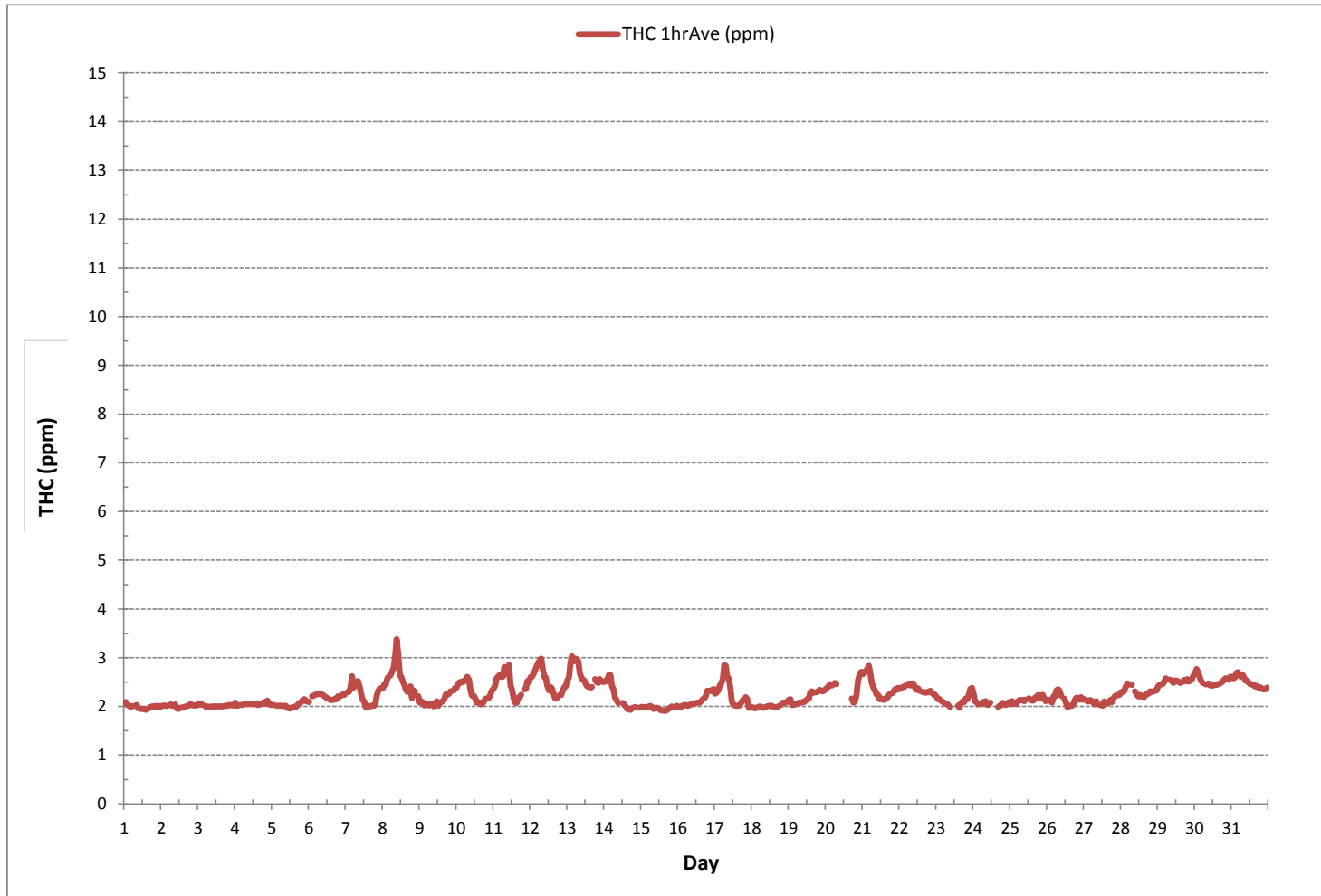
TRS[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



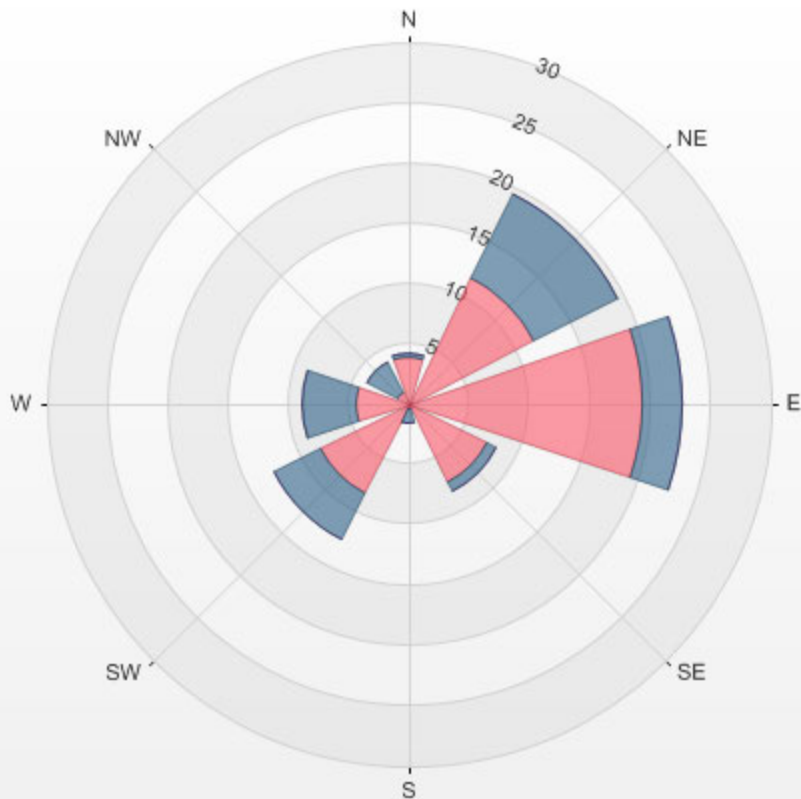
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-THC[ppm]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.44% Calm Avg: 2.49 [ppm]

Direction	0.0-1.1	1.1-2.3	2.3-3.4	>3.4	Total
N	0.0	3.9	0.3	0.0	4.2
NE	0.0	11.7	7.8	0.0	19.5
E	0.0	19.5	3.3	0.0	22.8
SE	0.0	7.4	0.7	0.0	8.1
S	0.0	0.4	1.3	0.0	1.7
SW	0.0	8.2	4.3	0.0	12.5
W	0.0	4.5	4.5	0.0	8.9
NW	0.0	1.2	2.7	0.0	3.9
Summary	0.0	56.6	24.9	0.0	81.6

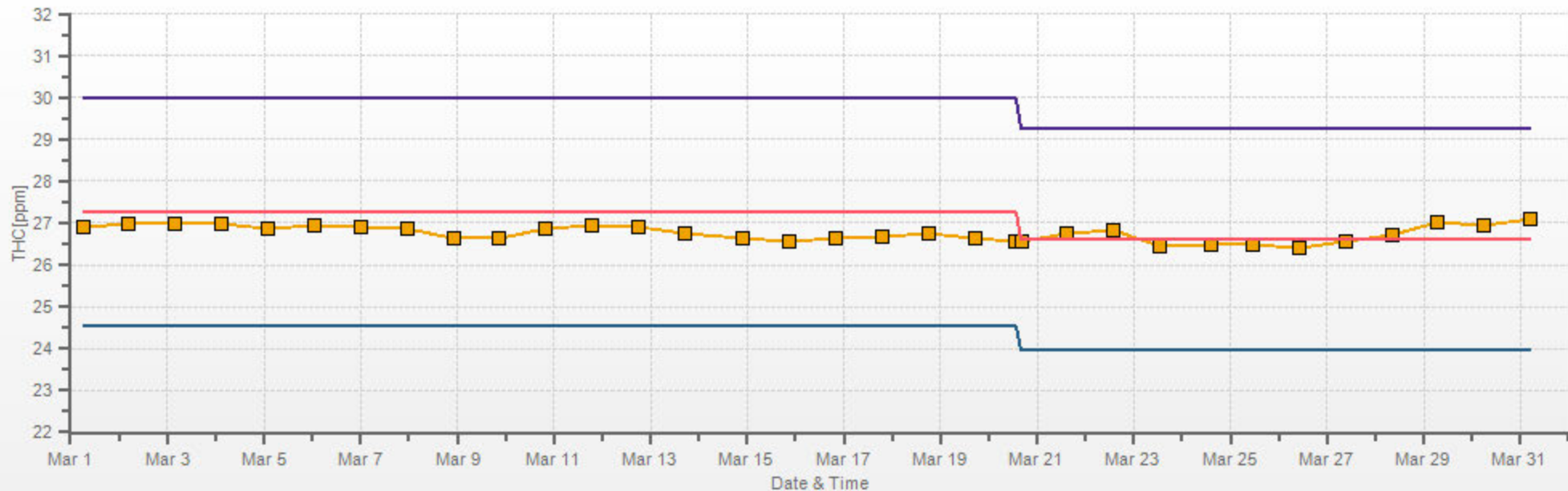
% Icon Classes (ppm) 0 0.0-1.1 57 1.1-2.3 25 2.3-3.4 0 >3.4

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-THC[ppm] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 18.44% Calm Poll Avg: 2.49[ppm]



THC[ppm] Calibration: LICA COLD LAKE SOUTH Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

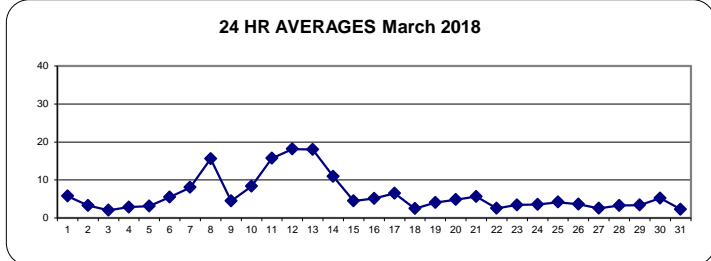
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	13	13	8	5	5	9	S	9	5	3	2	2	1	1	2	2	5	8	7	8	7	6	6	6	1	13	6	24
2	4	5	3	3	4	S	5	5	5	4	2	2	2	2	4	3	3	4	3	3	3	2	2	2	2	5	3	24
3	2	1	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	1	3	2	24
4	2	2	2	S	2	2	2	2	2	2	3	2	3	3	2	3	3	4	5	5	4	7	2	2	2	7	3	24
5	1	1	S	1	2	2	1	4	2	1	2	2	2	2	3	7	7	4	4	4	6	7	4	3	1	7	3	24
6	3	S	5	5	4	4	5	7	10	7	6	6	5	4	4	4	4	3	4	7	7	8	9	5	3	10	5	24
7	S	11	9	7	6	6	7	14	34	10	10	9	6	3	2	3	3	3	4	6	6	10	8	S	2	34	8	24
8	8	10	9	9	8	9	13	43	61	35	36	17	10	9	7	8	8	13	28	5	4	4	S	4	4	61	16	24
9	3	4	4	4	5	5	5	4	5	4	5	3	3	3	3	4	5	7	6	5	5	S	6	6	3	7	5	24
10	7	11	6	8	10	17	16	22	18	5	6	6	6	4	3	3	3	4	6	7	S	9	8	7	3	22	8	24
11	7	13	14	27	33	22	22	37	40	23	21	14	12	5	3	2	4	6	8	S	12	9	14	13	2	40	16	24
12	17	21	26	29	50	45	51	87	27	9	5	5	4	4	5	5	3	3	S	4	4	4	6	3	3	87	18	24
13	7	16	23	32	28	32	56	43	12	8	9	7	6	8	7	7	7	S	17	20	19	20	16	14	6	56	18	24
14	17	17	21	25	32	21	41	Q	Q	Q	Q	4	5	3	3	2	2	1	3	3	3	2	S	3	1	41	11	24
15	3	3	3	3	4	8	13	7	4	2	2	2	2	3	3	3	3	3	6	6	8	S	5	8	2	13	5	24
16	5	4	4	5	9	5	8	5	2	2	3	2	2	3	2	3	3	3	5	12	S	10	13	9	2	13	5	24
17	8	11	8	9	9	10	13	12	9	12	12	5	3	3	2	2	3	3	4	S	4	3	2	2	2	13	6	24
18	2	2	1	2	2	2	2	2	2	1	3	2	2	2	2	2	1	2	S	4	6	5	4	4	1	6	2	24
19	6	8	2	2	2	4	6	7	5	5	C	C	C	C	C	C	C	C	3	3	3	3	3	3	2	8	4	24
20	3	4	4	3	3	4	4	5	4	5	6	6	5	5	4	4	S	4	4	5	7	6	8	8	3	8	5	24
21	7	9	11	14	16	14	12	6	4	4	3	3	3	3	3	3	S	3	3	2	2	2	2	2	2	16	6	24
22	2	2	2	2	3	3	3	4	4	3	3	2	2	3	S	3	3	3	3	2	2	2	2	1	1	4	3	24
23	1	1	1	1	4	2	2	2	2	2	2	2	2	S	2	2	2	2	2	3	3	5	15	19	1	19	3	24
24	12	3	3	2	10	2	3	3	3	5	4	4	S	4	2	3	3	4	3	2	2	3	1	1	1	12	4	24
25	3	5	4	3	3	7	6	5	3	2	1	S	3	1	2	2	2	3	5	7	8	9	7	5	1	9	4	24
26	7	5	3	2	3	3	3	3	3	3	S	5	5	5	4	5	4	3	2	4	4	3	2	3	2	7	4	24
27	3	3	2	2	5	3	5	3	3	S	3	2	2	3	3	2	1	1	1	2	3	3	2	2	1	5	3	24
28	3	4	3	4	7	9	9	9	S	5	3	2	2	1	1	1	1	1	1	2	2	1	2	2	1	9	3	24
29	1	1	1	2	3	6	9	S	4	3	3	1	2	2	2	2	3	3	2	3	5	6	5	9	1	9	3	24
30	14	16	14	12	13	14	S	4	2	2	2	2	2	2	2	2	3	2	1	2	3	3	1	2	1	16	5	24
31	2	2	2	4	5	S	4	3	3	2	2	2	2	2	1	1	2	1	2	2	2	2	3	1	1	5	2	24
HOURLY MAX	17	21	26	32	50	45	56	87	61	35	36	17	12	9	7	8	8	13	28	20	19	20	16	19				
HOURLY AVG	6	7	7	8	10	9	11	12	10	6	6	4	4	3	3	3	3	4	5	5	5	5	6	5				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

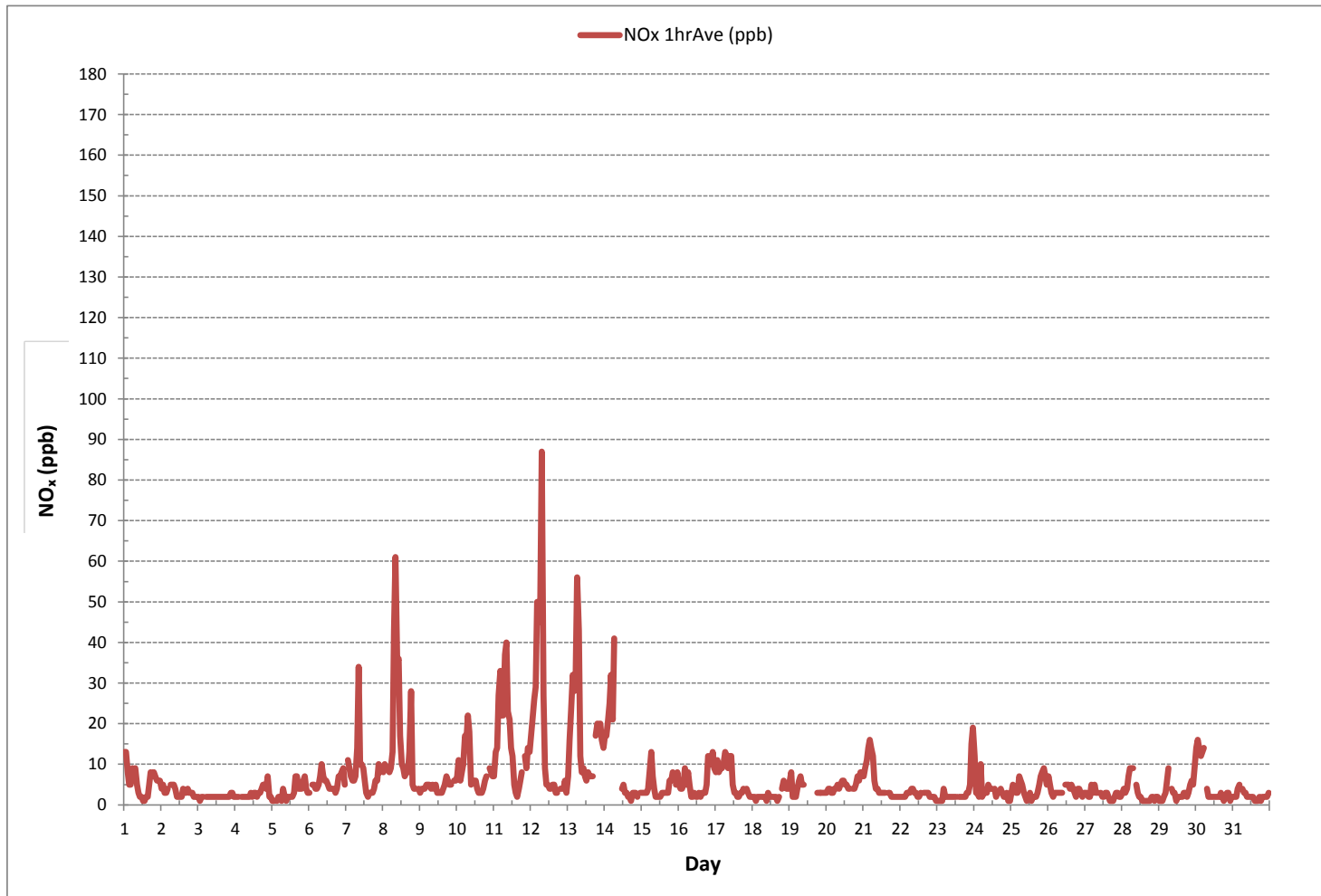
24 HR AVERAGES March 2018



MONTHLY SUMMARY

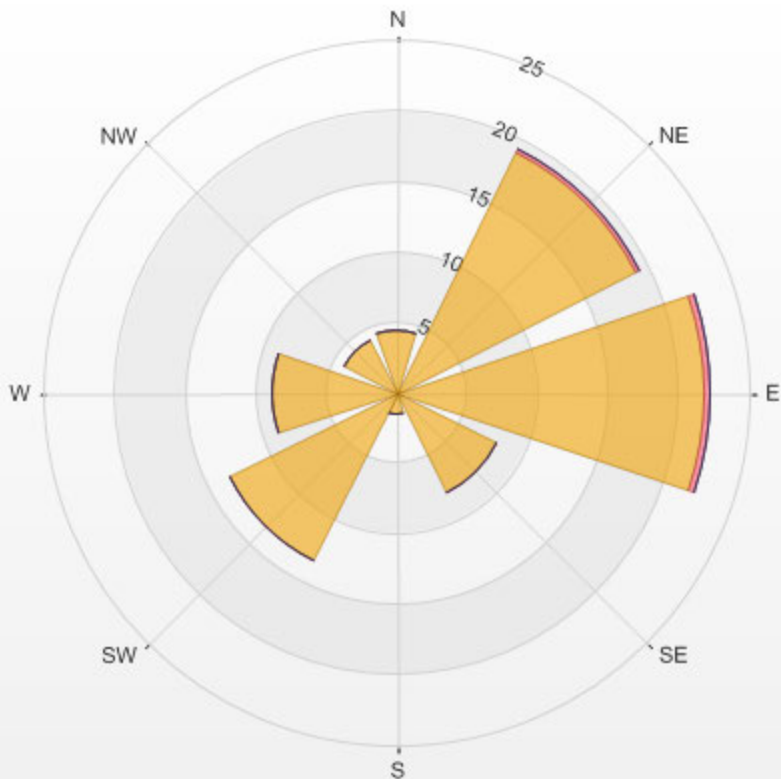
NUMBER OF NON-ZERO READINGS:	701			
MINIMUM 1-HR AVERAGE:	1 ppb	@ HOUR	12	ON DAY 1
MAXIMUM 1-HR AVERAGE:	87 ppb	@ HOUR	7	ON DAY 12
MAXIMUM 24-HR AVERAGE:	18 ppb			ON DAY 12
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	8	MONTHLY AVERAGE:	6 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



% Icon Classes (ppb) 81 0.0-29.3 1 29.3-58.7 0 58.7-88.0 0 >88.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NOX[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 18.31% Calm Poll Avg: 14.09[ppb]



NOX[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES



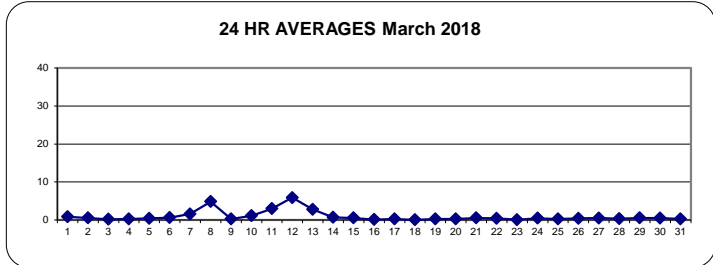
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59						
DAY																														
1	1	1	0	0	1	1	S	2	2	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	0	2	1	24		
2	0	1	0	0	0	0	S	0	1	1	1	1	1	1	2	1	1	1	0	0	0	0	0	0	0	0	2	1	24	
3	0	0	0	0	0	S	0	0	0	0	1	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	24	
4	0	0	0	0	S	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	24	
5	0	0	S	0	0	0	0	0	1	0	0	1	1	1	1	2	2	0	0	0	0	0	0	0	0	0	2	0	24	
6	0	S	0	0	0	0	0	1	2	2	2	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	2	1	24	
7	S	0	0	0	0	0	0	2	17	4	4	3	2	1	1	1	0	0	0	0	0	0	0	0	S	0	17	2	24	
8	0	0	0	0	0	0	0	20	35	16	18	7	4	3	2	2	1	1	2	0	0	0	0	S	0	0	35	5	24	
9	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	1	0	0	0	0	0	0	S	0	0	0	1	0	24	
10	0	0	0	0	0	2	1	7	7	1	2	2	2	1	1	0	0	0	0	0	0	S	0	0	0	0	7	1	24	
11	0	0	0	2	7	1	3	14	16	8	8	5	4	1	0	0	0	0	0	0	S	0	0	0	0	0	16	3	24	
12	1	1	2	4	20	15	21	52	11	2	1	1	1	1	1	1	0	0	S	0	0	0	0	0	0	0	52	6	24	
13	0	0	1	2	2	6	21	17	3	2	2	2	2	1	2	1	1	1	S	0	0	0	0	0	0	0	21	3	24	
14	0	0	0	1	3	1	5	Q	Q	Q	Q	1	1	1	1	0	0	0	0	0	0	0	0	S	0	0	5	1	24	
15	0	0	0	0	0	1	1	1	1	1	0	1	0	1	1	1	1	0	1	0	1	S	0	1	0	1	1	1	24	
16	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	24	
17	0	0	0	0	0	0	0	1	1	2	2	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	2	0	24	
18	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24	
19	0	0	0	0	0	0	1	1	1	1	C	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	1	0	24	
20	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	1	0	24	
21	0	0	0	1	2	1	1	1	0	1	1	1	0	1	1	S	0	0	0	0	0	1	0	1	0	0	2	1	24	
22	0	0	0	0	1	1	1	1	1	1	1	0	1	1	S	1	0	0	0	0	0	0	0	0	0	0	1	0	24	
23	0	0	0	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	1	0	24	
24	1	0	0	0	4	0	0	0	1	1	1	1	S	1	0	0	1	0	0	0	0	0	0	0	0	0	4	0	24	
25	0	0	1	0	0	0	1	1	1	0	0	S	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	24	
26	1	0	0	0	1	0	0	0	0	1	S	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	2	0	24	
27	0	0	0	0	2	1	1	1	1	S	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	2	1	24	
28	0	0	0	0	0	0	1	2	S	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	24	
29	0	0	0	0	1	1	2	S	1	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	2	1	24	
30	0	0	0	0	1	1	S	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	24	
31	0	0	0	0	0	S	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
HOURLY MAX	1	1	2	4	20	15	21	52	35	16	18	7	4	3	2	2	2	1	2	1	1	1	1	1	1	0	1	0	24	
HOURLY AVG	0	0	0	0	2	1	2	4	4	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	24

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

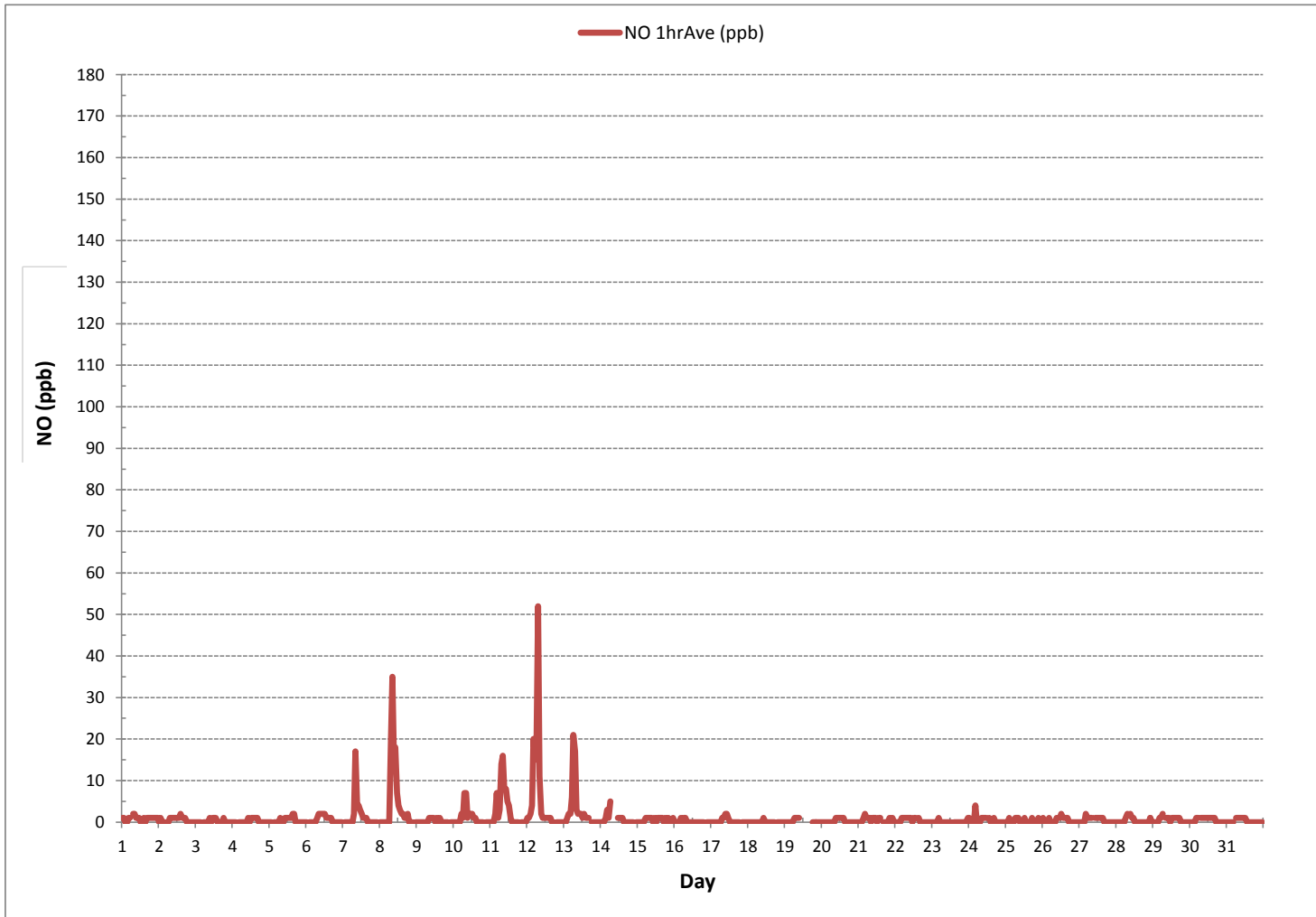
24 HR AVERAGES March 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	274			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	2	ON DAY
MAXIMUM 1-HR AVERAGE:	52 ppb	@ HOUR	7	ON DAY
MAXIMUM 24-HR AVERAGE:	6 ppb			ON DAY
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	8 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	1 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.31% Calm Avg: 2.53 [ppb]

Direction	0.0-17.7	17.7-35.3	35.3-53.0	>53.0	Total
N	4.4	0.0	0.0	0.0	4.4
NE	19.2	0.1	0.0	0.0	19.3
E	22.2	0.0	0.0	0.0	22.2
SE	7.9	0.0	0.0	0.0	7.9
S	1.6	0.0	0.0	0.0	1.6
SW	13.3	0.0	0.0	0.0	13.3
W	8.9	0.0	0.0	0.0	8.9
NW	4.2	0.0	0.0	0.0	4.2
Summary	81.5	0.1	0.0	0.0	81.7

% Icon Classes (ppb)

82

0.0-17.7

0

17.7-35.3

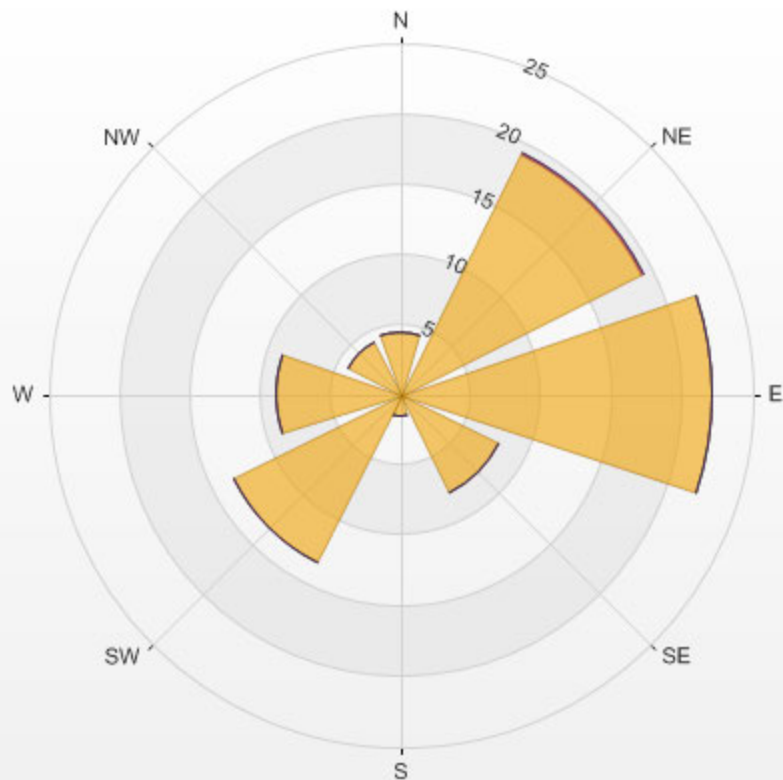
0

35.3-53.0

0

>53.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 18.31% Calm Poll Avg: 2.53[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	13	13	8	5	4	8	S	7	4	2	1	1	1	1	2	2	4	6	6	7	6	6	5	5	1	13	5	24	
2	4	4	3	3	3	S	4	4	3	3	2	2	1	1	3	2	2	3	2	2	2	2	2	2	1	4	3	24	
3	1	1	1	1	S	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	1	3	2	24
4	2	2	2	S	2	2	2	2	2	2	2	2	2	2	2	2	2	3	4	5	4	7	2	2	2	7	3	24	
5	1	1	S	1	2	2	1	3	2	1	1	1	1	2	3	5	5	4	4	4	6	7	4	3	1	7	3	24	
6	3	S	4	5	4	4	5	7	8	5	4	3	3	3	2	3	3	3	4	6	7	8	8	5	2	8	5	24	
7	S	11	9	7	6	6	7	12	18	7	6	5	4	2	2	2	2	3	4	6	6	10	8	S	2	18	7	24	
8	8	10	9	9	8	9	13	24	25	19	19	10	6	6	6	6	7	12	27	5	4	4	S	3	3	27	11	24	
9	3	4	3	4	4	4	5	4	5	4	4	3	3	3	3	4	4	6	6	5	5	S	6	6	3	6	4	24	
10	7	11	6	8	10	15	15	16	11	4	4	4	3	3	2	3	4	6	7	S	9	8	7	2	16	7	24		
11	7	12	13	26	26	20	19	23	24	15	13	10	8	4	2	2	4	5	8	S	12	9	14	13	2	26	13	24	
12	17	20	24	26	30	30	30	35	16	6	4	4	3	4	4	4	3	2	S	4	4	4	6	3	2	35	12	24	
13	7	15	22	30	27	26	35	26	9	6	7	5	5	6	6	6	6	S	16	19	19	20	16	14	5	35	15	24	
14	16	16	20	24	30	21	36	Q	Q	Q	Q	Q	3	4	3	2	2	1	1	2	3	2	2	S	2	1	36	10	24
15	2	3	2	3	3	7	11	6	3	2	2	2	2	2	2	2	3	3	5	6	8	S	5	8	2	11	4	24	
16	5	3	4	5	8	5	7	4	2	2	2	2	2	2	2	3	3	5	11	S	9	12	9	2	12	5	24		
17	8	11	8	9	8	10	13	11	8	10	10	4	2	2	2	2	3	4	S	4	3	1	1	1	1	13	6	24	
18	1	1	1	1	2	1	1	2	1	1	2	1	1	1	1	2	1	2	S	4	6	5	4	4	1	6	2	24	
19	5	8	1	2	2	4	6	6	4	4	C	C	C	C	C	C	C	C	3	3	3	3	3	3	1	8	4	24	
20	3	4	4	3	3	4	4	4	4	4	5	4	4	4	4	S	3	4	5	7	5	8	8	3	8	4	24		
21	7	9	11	14	14	14	11	5	3	3	2	2	2	3	2	S	2	2	2	2	2	1	2	2	1	14	5	24	
22	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	S	2	2	2	2	2	2	2	1	1	3	2	24	
23	1	1	1	1	3	2	2	2	2	2	2	2	2	2	S	2	2	2	2	2	3	3	5	14	18	1	18	3	24
24	11	3	3	2	7	2	2	2	3	4	3	3	S	3	2	2	3	4	3	2	2	2	1	1	1	11	3	24	
25	3	5	3	3	3	6	5	4	2	1	S	2	1	1	1	1	2	3	5	6	8	8	7	5	1	8	4	24	
26	7	5	3	2	2	3	3	3	3	3	S	4	4	4	3	4	3	2	2	4	4	3	2	3	2	7	3	24	
27	3	2	2	2	4	3	4	3	2	S	2	2	1	2	2	1	1	1	1	2	3	3	2	2	1	4	2	24	
28	3	4	3	4	7	9	8	7	S	3	2	2	1	1	1	1	1	1	1	2	2	1	1	1	1	9	3	24	
29	1	1	1	1	2	6	7	S	2	2	2	1	1	1	1	2	2	2	2	3	4	5	5	9	1	9	3	24	
30	14	16	14	11	13	13	S	3	1	1	1	1	1	1	1	1	2	2	1	2	3	3	1	2	1	16	5	24	
31	2	2	2	4	5	S	3	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	1	5	2	24	
HOURLY MAX	17	20	24	30	30	30	36	35	25	19	19	10	8	6	6	6	7	12	27	19	19	20	16	18	1				
HOURLY AVG	6	7	6	7	8	8	9	8	6	4	4	3	3	2	2	3	3	3	5	5	5	5	5	5	5				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

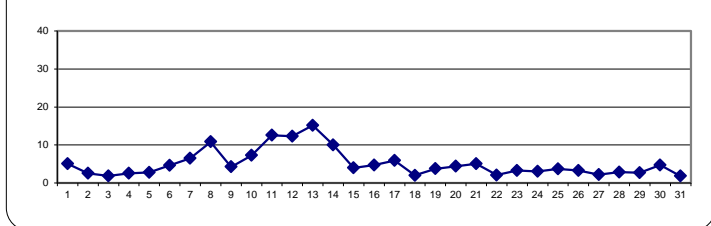
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

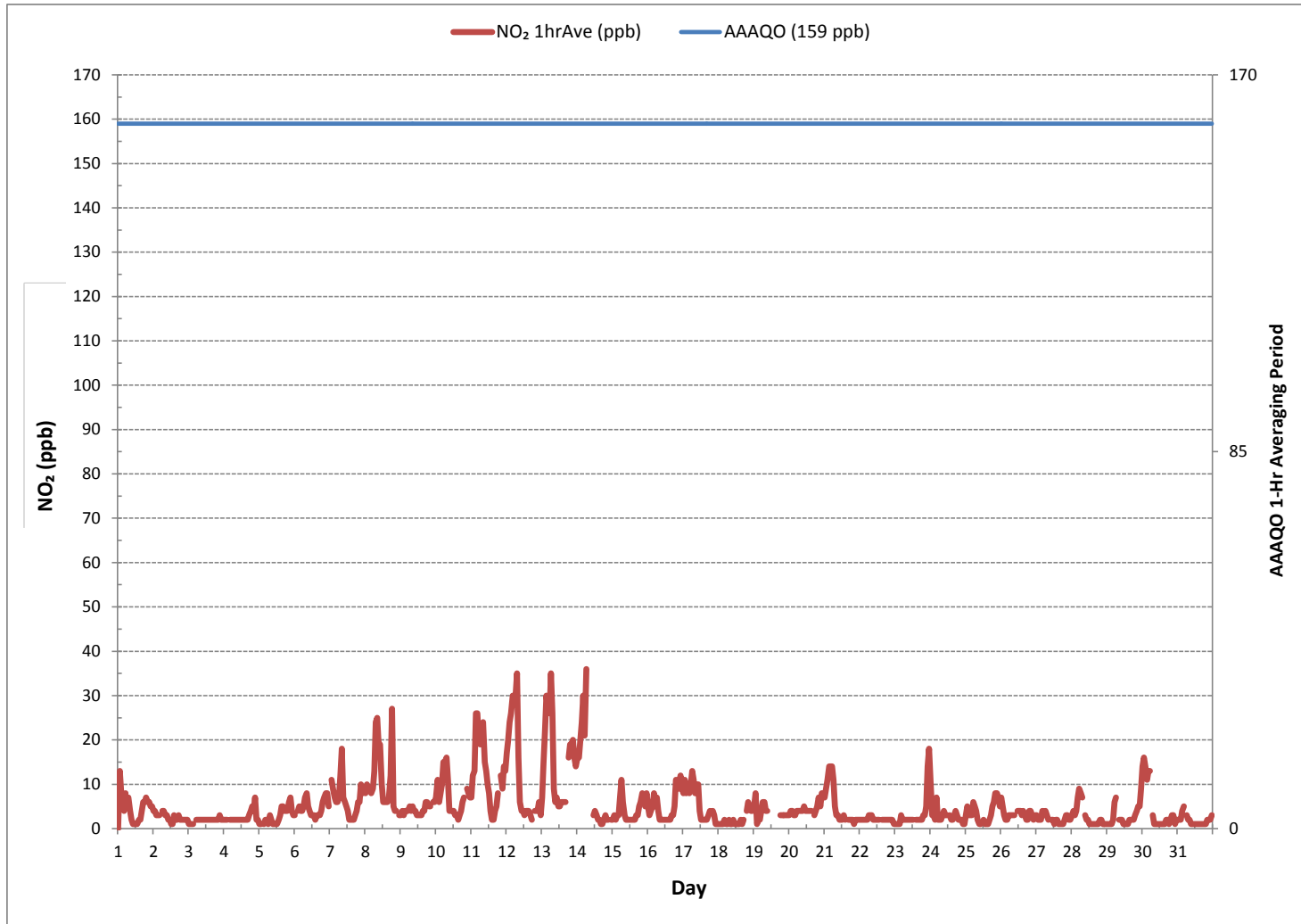
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	701			
MINIMUM 1-HR AVERAGE:	1	ppb @ HOUR	10	ON DAY 1
MAXIMUM 1-HR AVERAGE:	36	ppb @ HOUR	6	ON DAY 14
MAXIMUM 24-HR AVERAGE:	15	ppb		ON DAY 13
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	744
MONTHLY CALIBRATION TIME:	8	hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	6		MONTHLY AVERAGE:	5 ppb

24 HR AVERAGES March 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



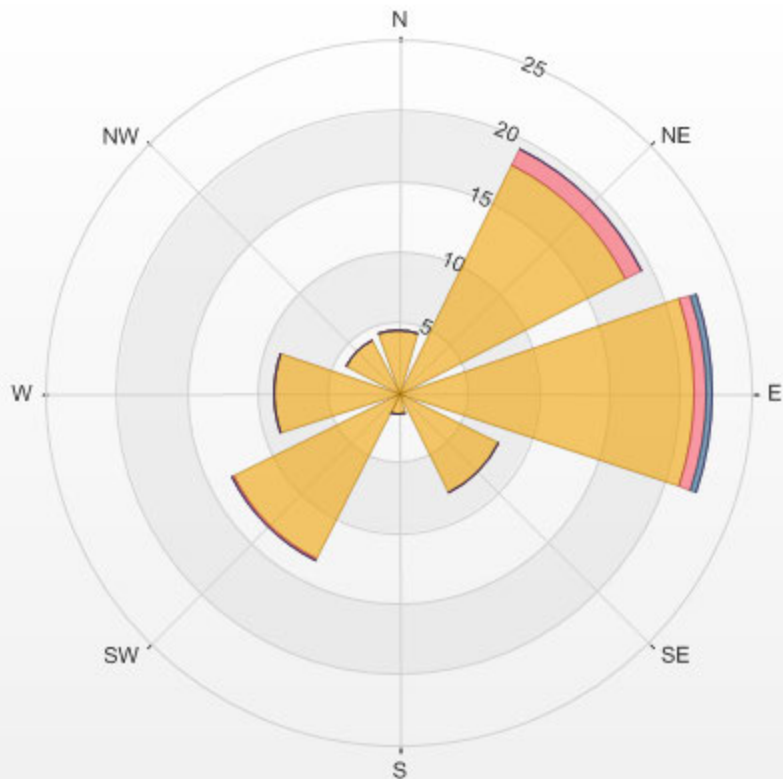
Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-NO2[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.31% Calm Avg: 11.55 [ppb]

Direction	0.0-12.3	12.3-24.7	24.7-37.0	>37.0	Total
N	4.4	0.0	0.0	0.0	4.4
NE	18.0	1.3	0.0	0.0	19.3
E	21.0	0.7	0.4	0.0	22.2
SE	7.9	0.0	0.0	0.0	7.9
S	1.6	0.0	0.0	0.0	1.6
SW	13.2	0.1	0.0	0.0	13.3
W	8.9	0.0	0.0	0.0	8.9
NW	4.2	0.0	0.0	0.0	4.2
Summary	79.1	2.2	0.4	0.0	81.7

% Icon	Classes (ppb)	79	0.0-12.3	2	12.3-24.7	0	24.7-37.0	0	>37.0
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LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-NO2[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 18.31% Calm Poll Avg: 11.55[ppb]



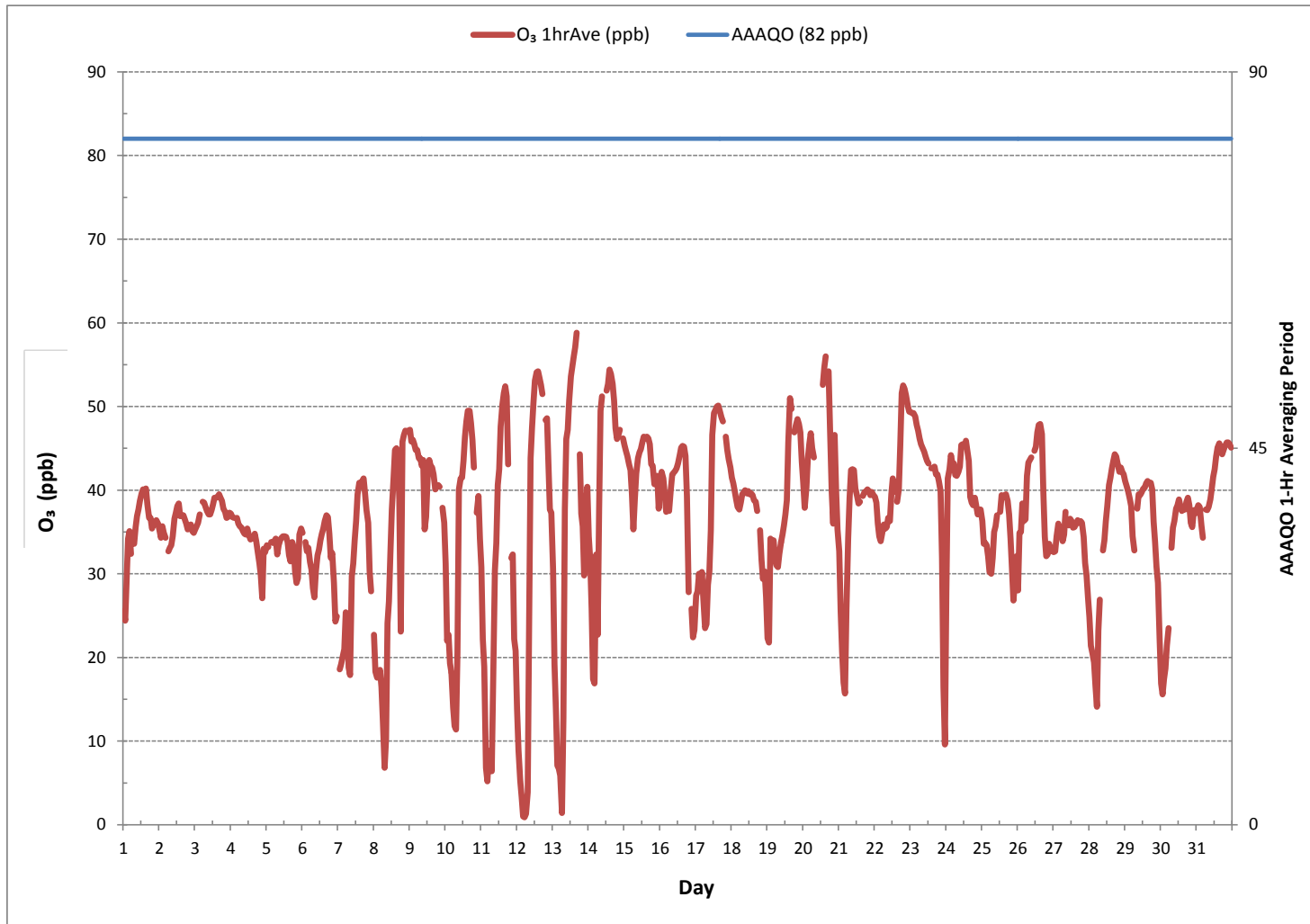
NO2[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



OZONE

OZONE Hourly Averages (O₃ ppb)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-O3[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 18.23% Calm Avg: 24.45 [ppb]

Direction	0.0-19.6	19.6-39.3	39.3-58.9	>58.9	Total
N	0.0	3.9	0.6	0.0	4.4
NE	0.0	12.3	7.0	0.0	19.2
E	0.4	13.5	8.6	0.0	22.5
SE	0.0	2.3	6.1	0.0	8.4
S	0.0	0.1	1.6	0.0	1.7
SW	0.3	5.0	7.3	0.0	12.5
W	0.1	3.6	5.1	0.0	8.8
NW	0.0	2.1	2.0	0.0	4.1
Summary	0.9	42.7	38.2	0.0	81.8

% Icon Classes (ppb)

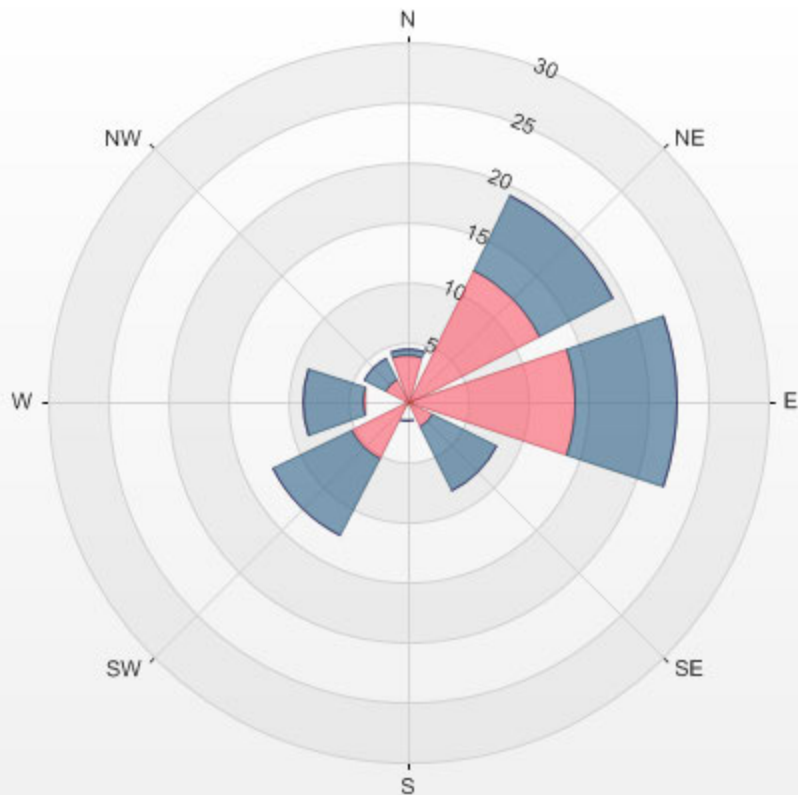
1 0.0-19.6

43 19.6-39.3

38 39.3-58.9

0 >58.9

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-O3[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 18.23% Calm Poll Avg: 24.45[ppb]



O3[ppb] Calibration: LICA COLD LAKE SOUTH Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



PARTICULATE MATTER 2.5



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	4	4	2	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	2	6	4	5	1	6	2	24
2	1	1	1	1	1	1	1	2	2	3	3	3	4	5	5	5	4	4	4	3	3	2	3	3	1	5	3	24
3	5	6	7	7	6	5	4	4	3	3	3	3	3	3	3	2	2	2	2	3	3	3	3	2	2	7	4	24
4	2	2	2	1	1	1	1	1	3	2	2	2	2	3	3	4	3	2	3	2	2	4	1	2	1	4	2	24
5	1	2	1	1	2	2	2	2	2	1	1	1	2	2	2	3	3	1	2	3	4	4	3	3	1	4	2	24
6	2	4	5	6	11	10	9	8	8	6	4	4	3	3	3	3	4	4	5	6	7	6	6	5	2	11	6	24
7	4	6	6	7	7	6	7	7	9	8	8	7	5	3	2	2	2	3	4	4	6	7	7	9	2	9	6	24
8	10	9	9	9	9	9	11	12	18	15	15	8	8	10	9	7	7	8	9	3	3	5	5	5	3	18	9	24
9	4	4	4	4	3	4	4	4	5	7	5	5	5	5	5	3	4	5	4	2	3	6	8	10	2	10	5	24
10	12	13	12	11	11	10	11	11	9	10	10	10	9	5	3	2	1	2	3	3	4	4	4	4	1	13	7	24
11	5	7	7	11	13	10	9	10	13	11	9	4	4	2	1	1	2	2	3	3	4	4	6	5	1	13	6	24
12	6	8	11	14	16	17	18	18	13	10	9	7	5	5	6	5	2	1	2	2	2	2	2	2	1	18	8	24
13	4	6	15	15	10	14	15	17	16	14	12	10	9	8	9	8	8	7	9	12	11	9	10	11	4	17	11	24
14	10	10	12	14	11	7	6	5	3	3	3	3	Q	Q	Q	Q	4	3	3	4	3	2	3	3	2	14	6	24
15	4	3	3	2	3	4	6	5	4	3	3	3	2	2	2	3	3	3	6	5	4	4	3	3	2	6	3	24
16	3	3	3	3	4	4	4	5	4	4	6	6	6	8	8	8	9	8	9	10	9	8	8	8	3	10	6	24
17	9	11	11	10	12	13	14	14	15	14	14	10	7	7	7	6	6	8	10	10	10	5	1	0	0	15	9	24
18	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	3	3	2	2	3	0	3	1	24
19	4	3	2	2	2	2	3	4	3	4	5	6	5	6	7	8	8	9	9	14	15	15	12	12	2	15	7	24
20	12	11	11	13	16	15	15	21	29	25	20	18	17	16	13	12	8	7	4	5	14	17	16	4	29	14	24	
21	16	16	16	17	18	21	14	10	9	7	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	21	7	24
22	1	1	1	1	1	2	3	4	4	5	5	4	6	5	3	3	4	4	4	7	7	6	4	2	1	7	4	24
23	2	2	3	3	3	4	5	5	5	4	4	5	6	6	6	6	6	6	8	8	8	8	13	19	2	19	6	24
24	17	13	12	11	9	7	6	4	3	3	5	7	9	8	5	4	2	1	1	1	1	1	0	1	0	17	5	24
25	1	1	0	0	1	1	1	1	0	0	0	1	1	1	1	1	1	2	2	4	3	3	4	3	0	4	1	24
26	3	4	5	7	7	11	22	19	15	11	9	8	C	10	10	11	6	2	2	1	1	0	0	0	0	22	7	24
27	0	0	0	0	0	0	0	0	21	0	1	3	1	1	0	0	0	0	0	0	0	0	0	0	0	21	1	24
28	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	2	1	1	1	2	1	24
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	4	1	4	1	24
HOURLY MAX	17	16	16	17	18	21	22	21	29	25	20	18	17	16	13	12	9	9	10	14	15	15	17	19				
HOURLY AVG	5	5	5	6	6	6	6	6	7	6	5	5	4	4	4	4	3	3	4	4	4	4	4	5				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

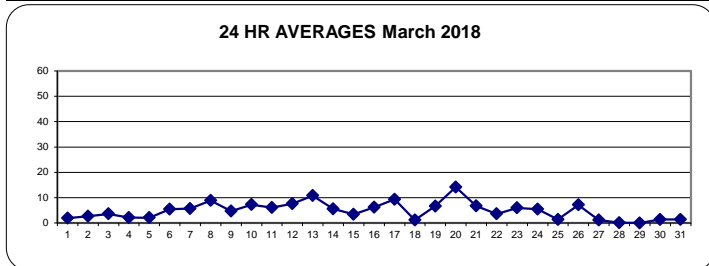
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80 µg/m ³	24-HR	30 µg/m ³
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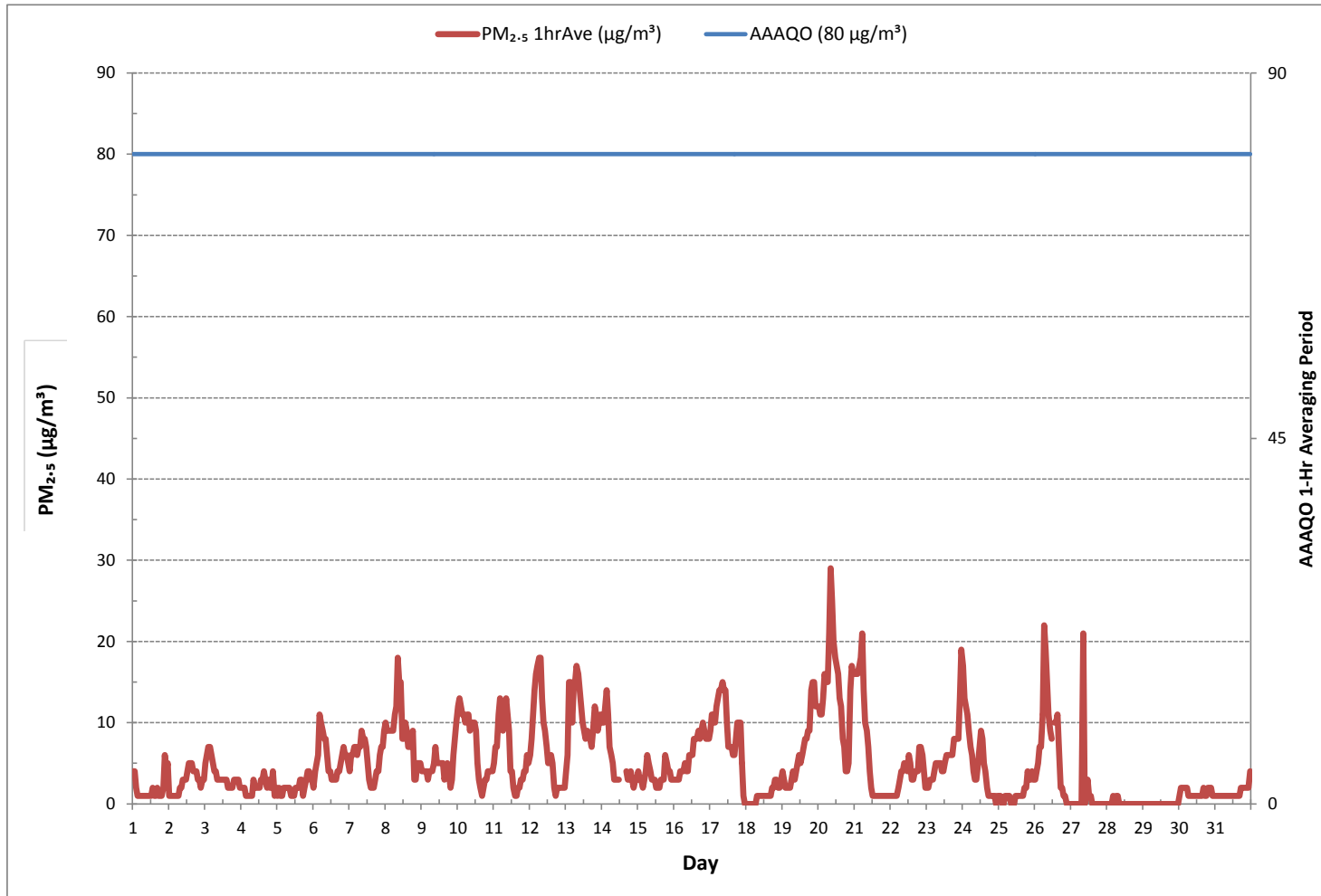
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF 24-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	658			
MINIMUM 1-HR AVERAGE:	0 µg/m ³ @ HOUR	23	ON DAY	17
MAXIMUM 1-HR AVERAGE:	29 µg/m ³ @ HOUR	8	ON DAY	20
MAXIMUM 24-HR AVERAGE:	14 µg/m ³		ON DAY	20
MONTHLY CALIBRATION TIME:	1 hrs	OPERATIONAL TIME:	744 hrs	
STANDARD DEVIATION:	5	AMD OPERATION UPTIME:	100.0 %	
		MONTHLY AVERAGE:	5 µg/m ³	

24 HR AVERAGES March 2018



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA COLD LAKE SOUTH
 Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

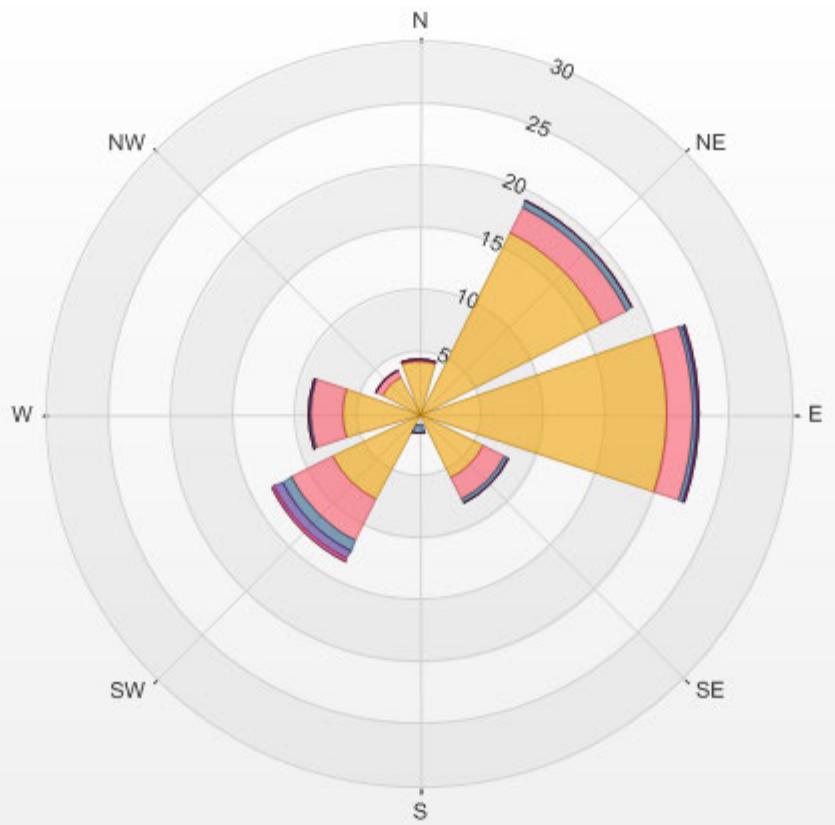
Calm: 17.96%

Calm Avg: 8.19 [ug/m3(L)]

Direction	0.0-6.0	6.0-12.0	12.0-18.0	18.0-24.0	24.0-30.0	>30.0	Total
N	4.2	0.1	0.0	0.0	0.0	0.0	4.4
NE	16.3	2.3	0.5	0.0	0.0	0.0	19.2
E	20.0	2.0	0.3	0.3	0.0	0.0	22.6
SE	5.9	1.9	0.3	0.0	0.0	0.0	8.0
S	0.1	0.8	0.7	0.0	0.0	0.0	1.6
SW	7.8	3.7	1.0	0.7	0.3	0.0	13.3
W	6.1	2.6	0.3	0.0	0.0	0.0	9.0
NW	3.3	0.7	0.0	0.0	0.0	0.0	4.0
Summary	63.7	14.2	3.0	1.0	0.3	0.0	82.0

% Icon Classes (ug/m3(L)) 64 0.0-6.0 14 6.0-12.0 3 12.0-18.0 1 18.0-24.0 0 24.0-30.0 0 >30.0

LICA COLD LAKE SOUTH Poll.: LICA COLD LAKE SOUTH-PM2.5_2[ug/m3(L)] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 17.96% Calm Poll Avg: 8.19[ug/m3(L)]



WIND SPEED



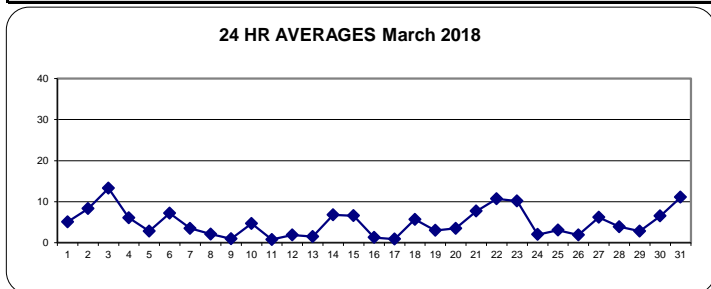
WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	2.5	2.1	2.5	3.0	3.9	2.9	4.7	5.8	8.0	8.1	10.0	8.6	5.9	4.3	4.7	4.4	3.8	6.3	7.1	6.0	5.9	4.9	5.8	6.5	2.1	10.0	5.1	24
2	3.5	3.5	3.8	4.9	5.5	4.8	4.6	7.2	7.5	8.2	13.7	12.4	9.9	12.6	11.6	13.8	12.0	11.1	10.3	9.8	9.4	12.9	12.4	12.7	3.5	13.8	8.3	24
3	12.7	12.1	13.2	14.2	14.4	15.1	16.5	15.8	14.5	13.6	15.5	14.7	13.9	13.8	12.7	12.9	13.5	12.5	12.4	12.1	10.9	9.5	11.5	11.5	9.5	16.5	13.3	24
4	11.0	10.1	11.5	9.8	7.7	6.3	6.8	7.1	7.6	5.8	6.1	7.0	6.8	7.8	7.4	5.5	4.4	4.1	3.2	1.7	2.0	2.5	6.8	5.3	1.7	11.5	6.1	24
5	7.9	8.0	7.3	6.7	6.0	5.3	6.8	4.8	6.6	7.7	5.3	4.8	4.3	1.8	1.0	1.5	1.4	5.8	2.8	2.3	2.6	4.2	6.2	4.3	1.0	8.0	2.8	24
6	5.9	7.3	8.0	6.5	9.1	7.0	9.7	9.2	7.9	8.4	9.5	10.2	9.7	11.5	10.9	10.6	9.5	7.2	5.1	4.5	5.5	2.3	0.4	0.8	0.4	11.5	7.2	24
7	0.5	0.8	0.5	0.4	2.1	4.1	1.3	0.4	1.8	4.7	4.6	5.9	8.0	8.4	9.3	7.3	6.6	4.8	3.1	4.1	5.3	2.6	0.6	0.5	0.4	9.3	3.5	24
8	1.0	0.4	1.4	0.7	0.7	0.1	0.9	0.4	0.7	2.6	3.9	4.9	5.8	5.2	4.2	4.1	3.4	1.7	2.0	7.5	7.0	5.6	7.6	6.8	0.1	7.6	2.1	24
9	6.9	7.4	6.5	7.0	5.7	7.0	5.9	5.8	4.1	4.8	4.5	3.6	1.4	0.8	4.2	6.1	7.1	6.8	6.5	6.0	5.2	6.0	6.1	5.1	0.8	7.4	1.0	24
10	2.3	0.2	0.6	2.6	1.7	2.0	0.2	0.7	1.9	6.4	7.7	8.1	9.2	8.8	9.6	10.2	9.8	7.1	5.1	4.7	3.0	5.0	5.2	3.4	0.2	10.2	4.7	24
11	3.4	0.3	0.3	0.5	0.5	1.2	0.2	0.8	2.0	1.9	2.7	1.2	4.2	0.7	5.1	5.3	6.4	3.9	1.2	0.4	0.5	0.3	0.3	0.3	0.2	6.4	0.8	24
12	0.3	0.7	1.1	0.1	0.4	1.0	0.6	0.8	1.8	3.8	2.5	2.6	7.3	7.8	7.4	7.1	5.6	3.4	2.6	2.5	2.0	1.0	0.3	0.6	0.1	7.8	1.9	24
13	1.5	0.9	1.8	1.2	0.8	0.5	0.9	1.5	1.2	2.7	1.3	2.5	1.6	3.3	5.2	5.0	3.4	2.7	2.4	2.5	2.2	0.9	1.0	1.7	0.5	5.2	1.5	24
14	3.9	1.7	1.4	1.0	2.4	2.5	3.5	3.9	5.6	7.4	7.1	7.6	8.9	8.3	9.8	12.2	11.8	15.0	9.4	9.8	10.6	9.8	8.7	8.4	1.0	15.0	6.8	24
15	7.7	8.8	9.5	6.8	5.7	6.5	5.1	5.6	6.7	7.5	8.6	8.6	7.9	7.9	8.2	8.0	7.5	7.5	5.6	5.9	4.0	3.1	3.4	2.6	2.6	9.5	6.6	24
16	4.1	5.9	5.1	3.0	3.0	3.5	3.3	4.7	5.1	4.9	4.8	3.8	2.9	3.2	3.4	2.9	4.3	2.2	0.9	0.7	1.2	0.4	1.1	0.9	0.4	5.9	1.3	24
17	1.0	1.1	0.7	2.7	2.4	0.7	0.0	1.2	1.5	1.2	2.1	2.6	4.9	3.4	1.9	1.1	3.5	4.1	4.0	2.9	1.8	6.0	11.3	9.7	0.0	11.3	0.9	24
18	7.8	8.6	9.0	8.0	8.0	8.9	9.9	10.4	10.0	10.3	8.2	7.4	6.5	6.4	5.1	2.6	4.8	3.5	3.5	3.8	2.8	1.5	2.9	1.1	1.1	10.4	5.7	24
19	0.7	0.9	5.7	4.0	6.2	4.2	4.0	2.8	2.9	3.5	4.2	5.1	5.7	5.6	6.5	5.9	6.5	6.8	3.1	3.9	5.0	3.3	2.3	0.9	0.7	6.8	3.0	24
20	1.6	0.9	2.0	3.8	3.2	4.4	3.0	4.1	3.1	4.9	7.7	7.4	7.2	6.1	7.3	7.0	6.8	4.1	2.9	1.1	1.8	1.4	0.7	1.3	0.7	7.7	3.5	24
21	0.8	0.2	0.8	1.3	1.1	1.0	4.4	7.0	7.8	8.9	8.8	8.0	9.6	9.9	11.3	11.6	12.0	11.9	12.5	13.5	12.8	11.1	10.6	8.8	0.2	13.5	7.7	24
22	9.0	10.3	8.8	8.5	8.6	9.7	9.2	8.9	9.1	9.1	12.1	12.0	11.7	11.4	14.2	14.0	12.7	13.1	14.3	15.6	14.6	13.6	12.7	13.2	8.5	15.6	10.7	24
23	14.2	13.2	14.3	13.6	13.8	12.8	12.3	12.6	12.7	13.3	12.9	14.6	16.6	14.9	14.4	12.4	9.8	4.0	3.9	4.9	5.1	1.6	1.3	2.0	1.3	16.6	10.2	24
24	4.1	5.4	6.2	10.0	9.9	4.9	2.9	3.6	6.0	8.9	8.6	7.0	7.3	9.9	9.8	7.6	7.9	7.5	9.6	6.4	4.8	4.9	6.3	6.8	2.9	10.0	2.0	24
25	4.4	3.4	4.3	4.5	2.9	3.2	2.6	3.7	3.9	3.1	4.0	2.9	4.4	4.9	4.4	7.2	4.4	4.6	3.8	2.0	1.8	1.4	2.7	2.5	1.4	7.2	3.1	24
26	2.8	3.6	4.1	9.7	3.4	3.4	3.9	5.6	5.6	5.9	4.2	8.2	9.7	9.9	9.2	8.3	11.8	14.2	12.1	14.0	13.0	11.6	10.2	8.6	2.8	14.2	1.9	24
27	7.0	6.8	7.5	8.6	6.2	7.3	8.5	11.2	12.4	11.4	12.6	11.1	10.4	8.5	6.6	5.5	6.8	6.9	6.9	5.4	3.2	1.2	0.6	0.8	0.6	12.6	6.2	24
28	0.4	0.3	0.5	0.3	0.1	2.3	4.9	5.6	6.1	8.4	9.4	10.8	12.3	14.2	11.3	11.2	11.6	10.7	11.5	9.0	10.9	12.4	12.8	11.4	0.1	12.8	3.9	24
29	9.4	7.8	8.0	9.2	7.2	4.2	5.5	7.3	6.2	5.8	7.6	6.0	6.0	3.9	3.4	3.8	7.5	5.7	3.0	1.2	0.7	0.1	0.5	0.3	0.1	9.4	2.8	24
30	0.4	0.9	0.2	0.7	1.5	2.5	3.8	7.5	10.3	10.5	8.7	4.7	13.2	11.2	14.3	14.2	14.9	15.1	13.9	11.3	7.2	5.1	7.5	6.2	0.2	15.1	6.5	24
31	7.3	8.1	6.0	6.4	7.5	7.5	9.4	9.6	9.9	10.1	11.1	14.4	15.8	17.5	16.7	17.9	18.9	14.0	15.0	12.8	12.6	9.3	7.3	7.8	6.0	18.9	11.1	24
HOURLY MAX	14.2	13.2	14.3	14.2	14.4	15.1	16.5	15.8	14.5	13.6	15.5	14.7	16.6	17.5	16.7	17.9	18.9	15.1	15.0	15.6	14.6	13.6	12.8	13.2				
HOURLY AVG	2.8	2.9	3.0	2.9	2.5	2.3	2.3	2.6	2.4	2.1	2.7	2.0	1.1	0.6	0.5	0.3	0.7	0.4	1.0	1.7	1.6	1.7	2.3	2.4				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

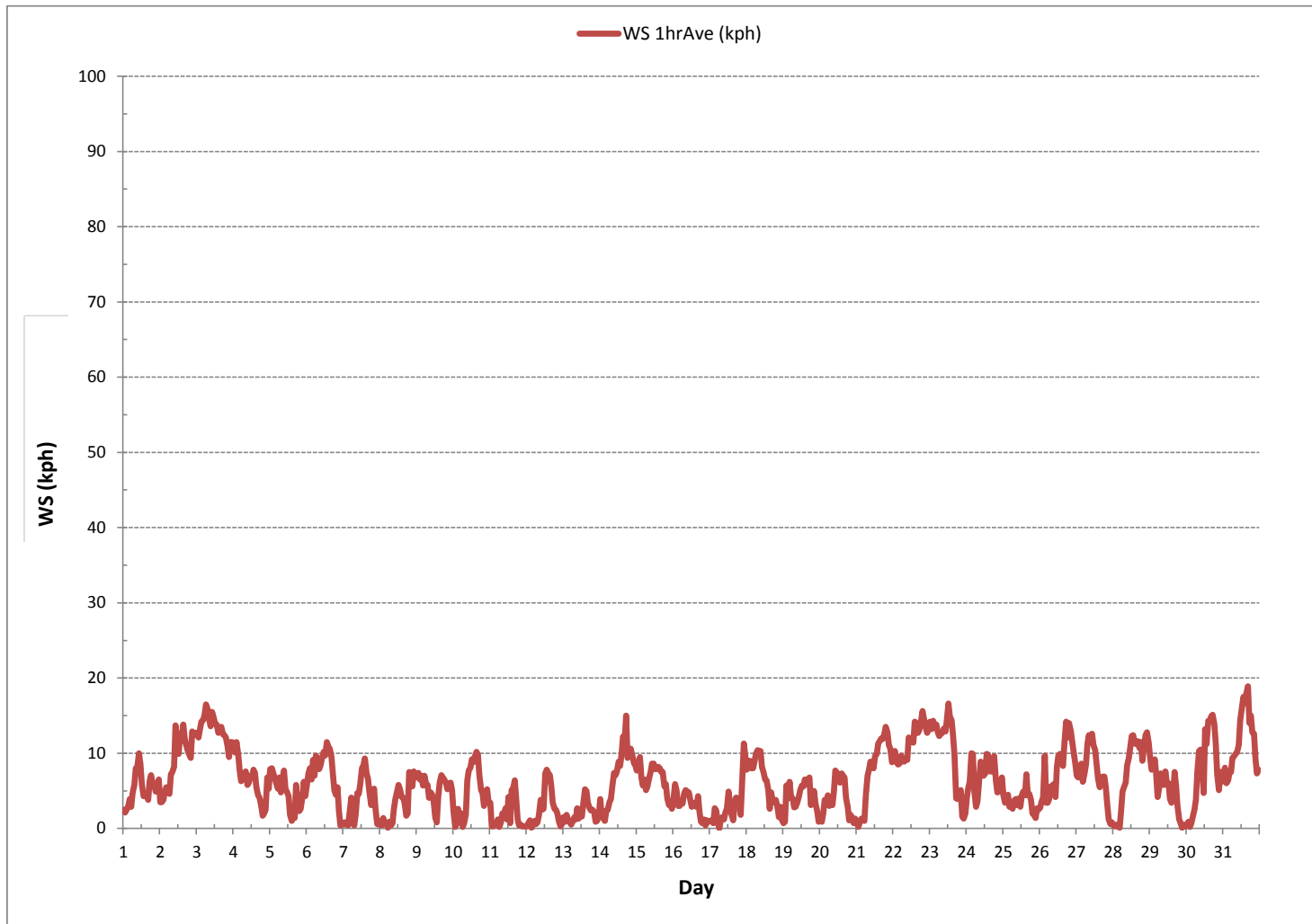
LAST CALIBRATION:	November 9, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	743
MINIMUM 1-HR AVERAGE:	0.0 kph @ HOUR 6 ON DAY 17
MAXIMUM 1-HR AVERAGE:	18.9 kph @ HOUR 16 ON DAY 31
MAXIMUM 24-HR AVERAGE:	13.3 kph ON DAY 3
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	4.1
MONTHLY AVERAGE:	1.7 kph

WIND SPEED Hourly Averages (WS kph)



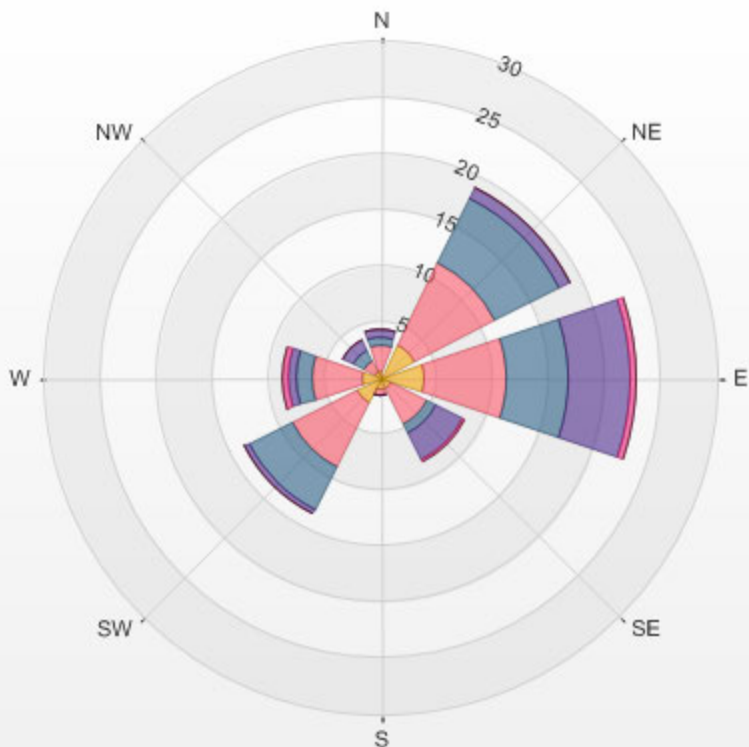
Wind: LICA COLD LAKE SOUTH
 Monitor: WSP [kph]
 Monthly: 18/03
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 17.74%

Direction	1.8-3.8	3.8-7.6	7.6-11.4	11.4-15.2	15.2-19.0	>19.0	Total
N	0.5	2.4	0.7	0.7	0.0	0.0	4.3
NE	3.4	8.1	6.5	1.1	0.0	0.0	19.0
E	3.9	7.3	5.5	5.5	0.5	0.0	22.7
SE	1.1	3.6	0.8	2.7	0.1	0.0	8.3
S	1.1	0.5	0.0	0.0	0.0	0.0	1.6
SW	2.4	6.5	4.3	0.4	0.0	0.0	13.6
W	1.8	4.4	1.3	0.7	0.7	0.0	8.9
NW	0.7	0.9	1.1	1.2	0.0	0.0	3.9
Summary	14.8	33.7	20.2	12.2	1.3	0.0	82.3

% Icon	Classes (kph)	15		1.8-3.8	34		3.8-7.6	20		7.6-11.4	12		11.4-15.2	1		15.2-19.0	0		>19.0
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LICA COLD LAKE SOUTH 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 17.74% Calm Wind Avg Speed: 0.89(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.		
DAY																												
1	NE	ENE	NNE	NNE	NE	NE	ENE	NE	NE	NE	NE	NE	NE	NNE	E	E	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	NE	24	
2	NE	NNE	NNE	NNE	NNE	NNE	NNE	NE	NE	ENE	E	E	ESE	E	E	E	E	E	E	E	E	E	E	E	E	ENE	24	
3	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ESE	E	E	E	E	E	E	E	E	24
4	E	E	E	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	E	E	E	ESE	E	ESE	ENE	N	NE	NE	NE	NE	E	24	
5	NNE	NNE	NNE	NNE	NNE	NNE	N	N	NNW	NNW	NNE	ENE	E	ENE	ENE	ENE	S	SW	SW	SW	WSW	W	W	W	N	24		
6	W	W	W	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	WSW	WSW	S	S	WSW	24	
7	ENE	SE	SSW	W	SSW	W	WSW	S	W	WSW	WSW	WSW	WSW	WSW	SW	SW	SW	WSW	WSW	SW	SW	SW	SW	SW	ESE	WSW	24	
8	SSE	ENE	WSW	ESE	WSW	WNW	W	ENE	NNW	ENE	ENE	ENE	NE	NE	NE	NE	NNE	NNE	ESE	SE	SE	SE	SE	ESE	E	24		
9	ESE	E	ESE	E	E	E	E	E	E	E	ENE	ENE	NNE	SE	W	W	W	WSW	SW	WSW	WSW	WSW	WSW	WSW	SSE	24		
10	WSW	NW	SW	SW	SW	WSW	NW	ENE	WSW	SW	SW	WSW	WSW	WSW	SW	SW	SW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	24	
11	WSW	SSW	E	E	SSE	W	E	ENE	E	ESE	E	NNW	NW	NE	W	WSW	WSW	SW	S	S	SE	SSE	S	ESE	WSW	24		
12	ENE	W	ENE	ESE	SE	E	E	SSE	SSW	WNW	NW	WNW	W	W	WSW	W	SW	S	SSE	SSW	SW	W	S	SW	WSW	24		
13	SE	ESE	ESE	ESE	ENE	ESE	E	SSW	NW	ENE	ENE	NW	N	NE	NE	NE	ENE	NE	NE	ENE	ENE	ENE	E	ENE	ENE	24		
14	ENE	E	ESE	E	E	ESE	E	E	E	ESE	ESE	E	E	E	ESE	SE	SE	SE	ESE	E	E	ESE	E	E	ESE	24		
15	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	ESE	ENE	E	24		
16	E	E	E	ESE	ESE	ESE	ESE	SE	SE	SE	SE	SSE	WSW	W	NW	WNW	W	W	WSW	NE	NE	WSW	SSE	W	SE	24		
17	N	NE	WNW	WSW	WSW	NE	ENE	W	WNW	N	ENE	E	SE	ESE	E	SE	WSW	SW	W	W	NNW	NNE	NE	NE	NNE	24		
18	NE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ESE	ESE	E	ESE	ESE	E	SE	E	NE	24		
19	ENE	ESE	SE	SE	SE	ESE	ESE	ESE	E	E	E	SE	SE	SE	SE	S	SW	SW	SSW	S	SSW	SSW	S	S	SSE	24		
20	SE	SE	SSE	SSE	S	SW	SSW	SW	SSW	SW	WSW	WSW	SW	SW	WSW	WSW	SW	WSW	SW	SSW	SW	S	SSE	SE	SW	24		
21	ESE	W	E	E	NNE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	24	
22	NE	NE	NE	NE	NE	NE	ENE	ENE	E	E	E	E	E	E	E	E	E	E	E	E	ESE	ESE	ESE	ESE	E	24		
23	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	SSE	SE	SE	SE	SE	NE	E	SE	24		
24	ESE	ESE	ESE	SE	SE	SE	SSE	SW	WSW	WSW	W	W	WSW	WNW	NW	WNW	NNW	NNW	NNW	NNW	N	N	NNW	NNW	WNW	24		
25	NNE	NE	NE	NE	N	NE	ENE	E	NE	ESE	ESE	ENE	NE	NNW	NE	N	NNE	NE	ENE	E	ENE	NE	NE	NE	NE	24		
26	ENE	ESE	SE	SE	SSE	SSE	SSW	SW	SW	SW	WSW	SW	SW	SW	SW	WSW	NW	NNW	N	NNE	N	NNE	NNE	NE	NW	24		
27	NE	NE	ENE	E	E	ENE	E	E	E	E	E	E	E	E	E	E	NE	NNE	NNE	NNE	NNE	WSW	SW	SSW	ENE	24		
28	WSW	S	SSW	SE	SSE	WSW	WSW	WSW	SW	SW	WSW	WSW	W	WNW	WNW	WNW	NW	NW	NW	NNE	NE	NE	NE	NE	NW	24		
29	NE	NE	NNE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	ESE	SW	W	WSW	WSW	S	S	SE	WSW	ENE	NE	24			
30	NE	NNE	NW	W	NNE	NNE	NE	NNE	NNE	NNE	NNE	NE	NNW	NNW	NW	NW	NNW	NNW	NNW	NW	NW	W	WNW	WNW	NNW	24		
31	WNW	WNW	W	WSW	WSW	W	W	W	W	W	W	WSW	WSW	WSW	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	SW	SW	WSW	24	

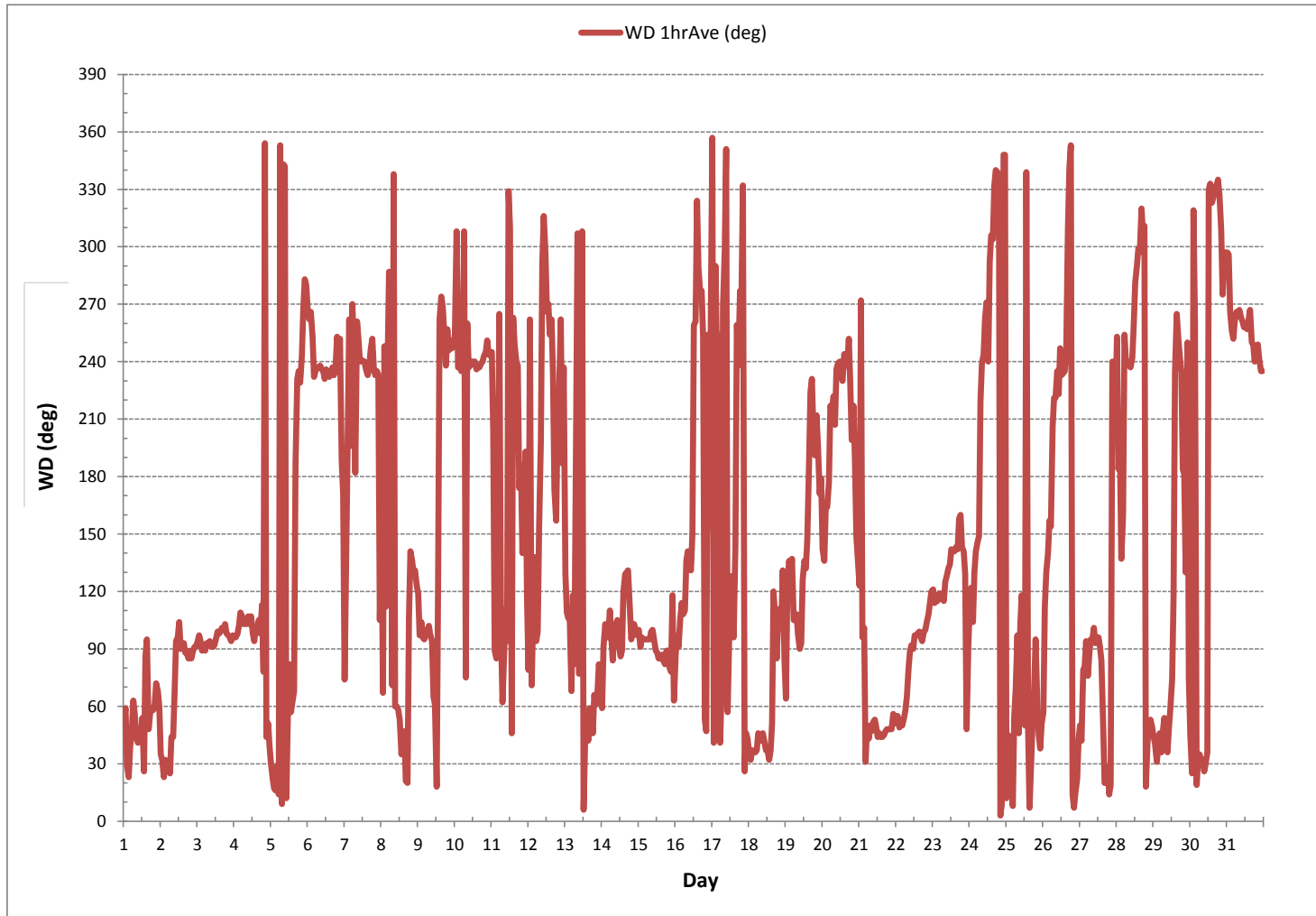
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	November 9, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	92		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	83	(E)

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59			
DAY																											
1	17	23	19	18	17	14	18	14	16	17	15	16	26	36	29	28	20	12	12	11	13	16	16	12	24		
2	16	23	27	19	16	20	22	15	14	21	18	21	24	19	21	17	18	20	18	18	19	18	18	19	18	24	
3	21	21	20	19	17	19	18	19	19	19	18	18	20	21	20	21	21	21	21	19	20	20	17	18	24		
4	18	19	18	21	23	24	20	22	21	22	22	22	21	20	22	24	23	23	25	29	27	20	20	23	24		
5	18	17	17	18	17	16	18	24	13	14	20	23	26	49	36	41	59	15	25	18	27	19	18	18	24		
6	17	17	18	16	13	13	13	13	15	14	16	17	18	17	15	17	16	15	12	13	12	25	47	48	24		
7	57	62	37	48	32	19	30	47	23	23	23	20	19	21	19	19	19	14	15	13	13	26	70	35	24		
8	44	57	43	52	67	56	60	59	68	25	18	10	10	18	21	19	20	18	20	13	13	20	17	22	24		
9	22	18	21	17	17	17	21	24	24	24	26	26	41	72	31	23	21	17	15	16	14	11	11	10	24		
10	35	65	67	20	26	26	61	48	33	17	18	18	18	18	17	15	17	15	13	10	17	8	9	13	24		
11	13	67	71	44	57	53	47	29	16	23	26	43	31	54	23	21	15	14	30	58	61	53	47	51	24		
12	37	48	27	70	56	51	40	42	46	23	28	52	18	16	18	17	26	30	29	36	33	35	42	37	24		
13	50	37	22	27	48	57	53	59	29	37	51	37	54	36	17	19	19	19	12	15	20	41	37	30	24		
14	10	20	26	35	18	17	15	17	22	21	24	23	20	21	24	21	20	18	18	17	19	22	20	19	24		
15	19	15	15	17	22	16	18	21	21	22	22	23	23	22	21	20	20	18	17	15	15	23	27	21	24		
16	18	19	22	34	25	23	21	16	12	16	22	40	45	37	32	41	21	28	28	45	25	61	46	64	24		
17	65	48	74	42	30	41	55	36	31	29	43	45	27	32	65	47	24	14	17	22	33	20	14	15	24		
18	18	17	18	19	18	19	17	17	17	15	18	18	18	21	19	47	24	25	24	22	18	43	20	49	24		
19	56	50	15	24	13	19	20	21	27	28	28	34	31	28	28	36	27	20	35	39	31	37	40	51	24		
20	55	57	37	39	37	24	29	25	36	24	21	26	22	29	19	20	19	17	19	51	46	54	53	28	24		
21	48	64	55	27	55	38	18	14	14	15	14	15	16	15	16	15	15	14	15	14	14	14	14	13	24		
22	14	13	14	14	14	14	14	17	18	21	20	22	21	22	21	21	19	17	19	21	22	22	25	23	24		
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28	60	53	61	58	60	40	16	16	18	17	17	21	24	21	22	22	18	16	14	20	17	16	14	14	24		
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30	54	50	66	60	50	29	18	17	18	18	22	33	22	27	20	21	18	15	14	13	14	18	16	15	24		
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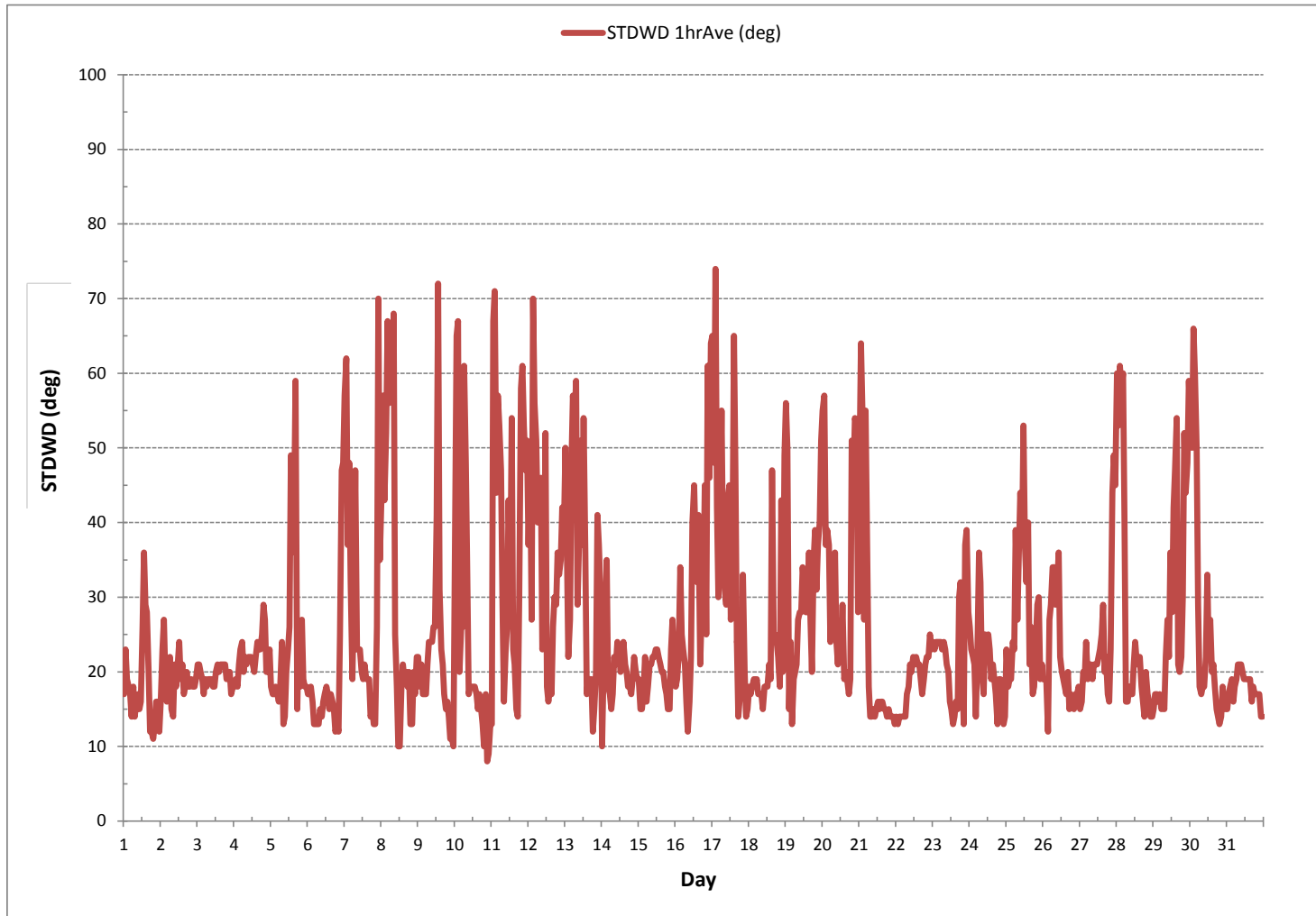
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: November 9, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

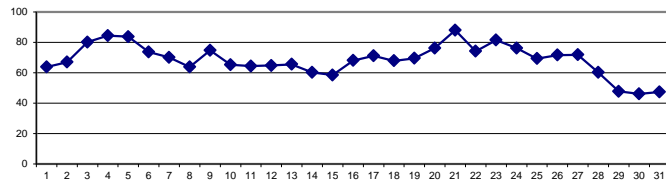
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	85	87	86	84	83	82	80	80	79	76	72	64	52	45	43	41	43	43	45	48	50	50	54	60	41	87	64	24
2	65	69	72	75	77	78	79	79	75	74	74	73	67	65	62	61	59	58	58	57	56	56	58	61	56	79	67	24
3	67	71	74	76	76	77	81	83	82	82	85	85	81	80	78	78	76	77	80	82	84	88	90	90	67	90	80	24
4	89	89	89	89	87	87	87	87	87	87	84	82	82	82	81	80	79	79	81	82	83	85	84	84	79	89	84	24
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6	85	85	84	84	84	84	82	82	79	75	68	64	61	60	58	58	58	60	67	74	75	79	81	80	58	85	74	24
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8	81	79	77	77	76	75	74	75	72	70	66	59	55	52	50	49	51	54	63	45	49	57	62	64	45	81	64	24
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10	87	85	83	81	81	80	78	78	76	67	56	50	46	43	44	43	45	49	54	61	67	69	69	73	43	87	65	24
11	78	81	82	83	83	83	83	81	75	63	54	46	42	36	33	32	35	38	54	68	74	77	81	82	32	83	64	24
12	83	84	85	85	85	85	84	82	72	63	54	48	44	43	42	41	39	42	51	55	61	71	76	79	39	85	65	24
13	83	85	86	86	85	83	84	83	76	66	58	48	40	41	40	40	42	41	52	64	68	72	74	75	40	86	66	24
14	77	79	81	83	84	80	79	72	62	57	51	47	46	43	38	37	39	42	48	55	58	60	62	65	37	84	60	24
15	68	69	69	70	73	75	76	74	68	63	59	55	51	47	46	43	41	44	47	49	51	53	53	58	41	76	58	24
16	61	63	66	69	70	69	69	68	67	65	64	63	61	62	62	62	62	61	70	77	80	80	81	80	61	81	68	24
17	79	80	79	80	80	81	81	79	75	71	66	65	63	58	58	60	63	70	72	73	69	62	64	58	81	71	24	
18	63	65	66	68	69	71	73	74	76	75	72	67	63	61	61	59	62	64	64	65	69	72	73	76	59	76	68	24
19	80	76	68	68	69	70	71	72	71	70	69	65	63	61	61	54	58	66	72	73	75	77	78	82	54	82	70	24
20	86	87	87	86	86	86	86	87	86	81	77	69	66	63	57	55	56	57	66	76	80	78	83	88	55	88	76	24
21	88	87	87	89	89	88	89	89	89	90	88	91	91	96	93	89	87	84	84	85	84	85	83	85	83	96	88	24
22	86	85	84	83	82	82	83	81	82	86	87	84	80	72	65	61	62	59	59	63	65	66	63	58	58	87	74	24
23	58	59	60	64	66	70	82	87	90	91	90	89	86	85	86	85	83	84	84	87	90	92	93	93	58	93	81	24
24	94	97	98	98	94	89	86	77	65	60	60	62	65	71	74	69	69	67	69	70	69	73	75	75	60	98	76	24
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27	70	71	68	67	69	72	75	74	75	73	74	74	68	65	63	65	66	68	73	72	76	81	82	81	63	82	72	24
28	79	78	77	77	76	77	82	81	79	74	66	58	55	48	45	41	38	37	37	42	48	50	50	51	37	82	60	24
29	52	51	53	55	57	62	63	57	51	45	42	39	36	33	31	29	32	33	37	48	53	57	63	67	29	67	48	24
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31	51	53	57	59	61	62	59	55	49	44	40	35	33	32	32	29	34	39	46	49	52	54	56	57	29	62	47	24
HOURLY MAX	94	97	98	98	94	89	91	92	90	91	90	91	91	96	93	89	87	84	84	87	90	92	93	93				
HOURLY AVG	76	76	77	77	78	78	79	77	74	70	67	63	60	58	56	55	56	58	62	65	68	70	72	73				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

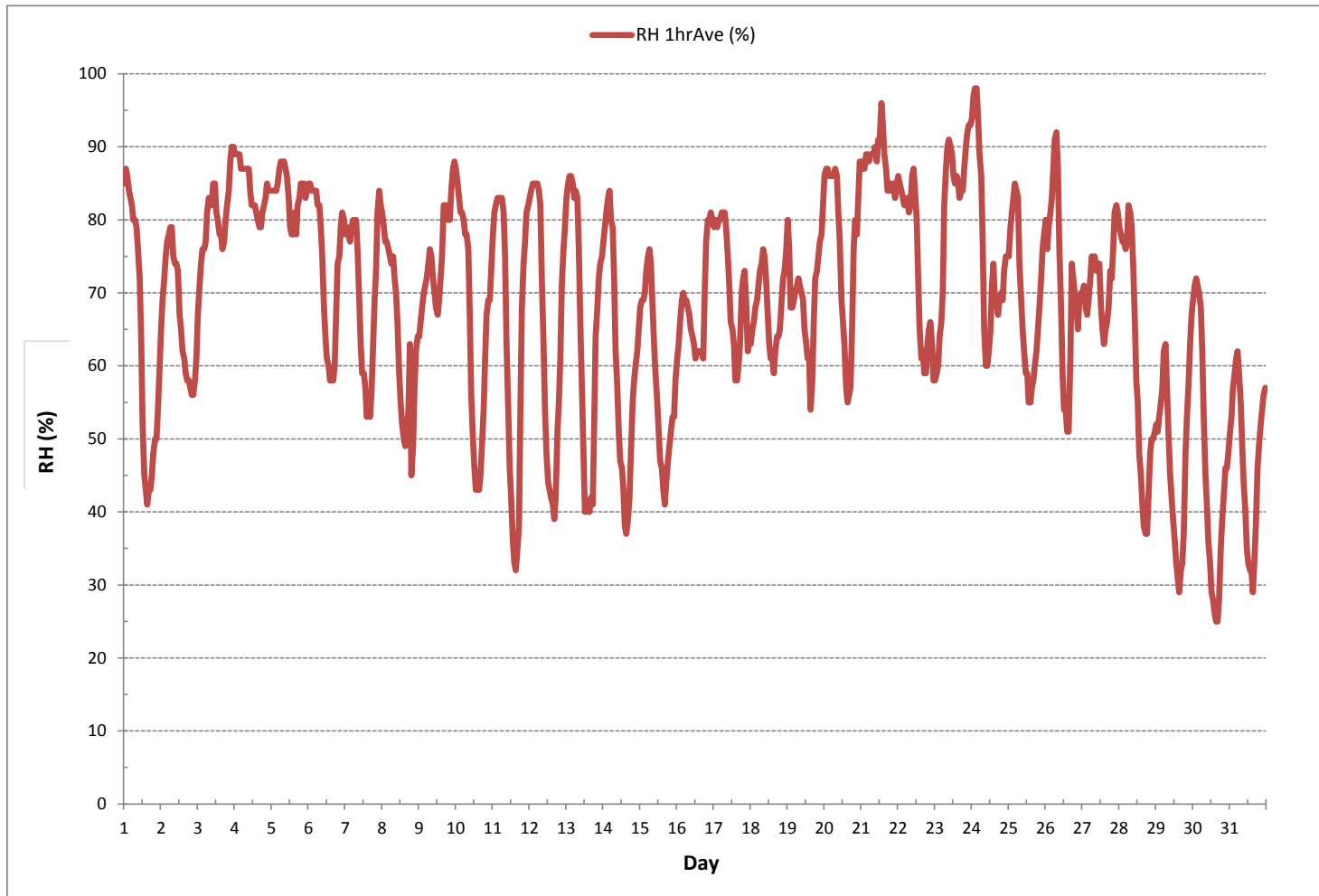
24 HR AVERAGES March 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	25	%	@ HOUR	15	ON DAY	30
MAXIMUM 1-HR AVERAGE:	98	%	@ HOUR	2	ON DAY	24
MAXIMUM 24-HR AVERAGE:	88	%			ON DAY	21
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	15					MONTHLY AVERAGE: 69 %

RELATIVE HUMIDITY Hourly Averages (RH %)



AMBIENT TEMPERATURE



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

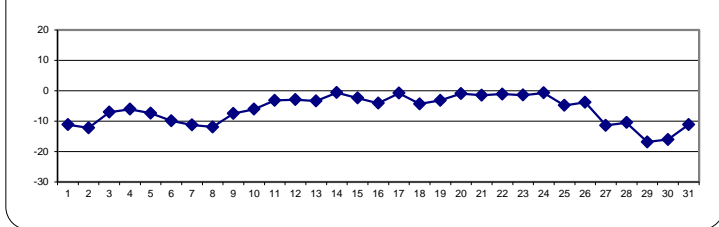
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

Table with columns: HR START (MST), HR END (MST), DAY (1-31), and 24 columns of hourly temperature averages (0:00 to 23:00). Includes sub-headers for DAILY MIN, DAILY MAX, 24-HR AVG, and RDGS. Values are in degrees Celsius, with some cells highlighted in blue.

STATUS FLAG CODES

Legend table for status flags: C - MONTHLY CALIBRATION, C1 - REPEAT CALIBRATION, Y - MAINTENANCE, S - DAILY ZERO/SPAN CHECK, S1 - REPEAT ZERO/SPAN CHECK, Q - QUALITY ASSURANCE, R - RECOVERY, X - MACHINE MALFUNCTION, G - OUT FOR REPAIR, P - POWER FAILURE.

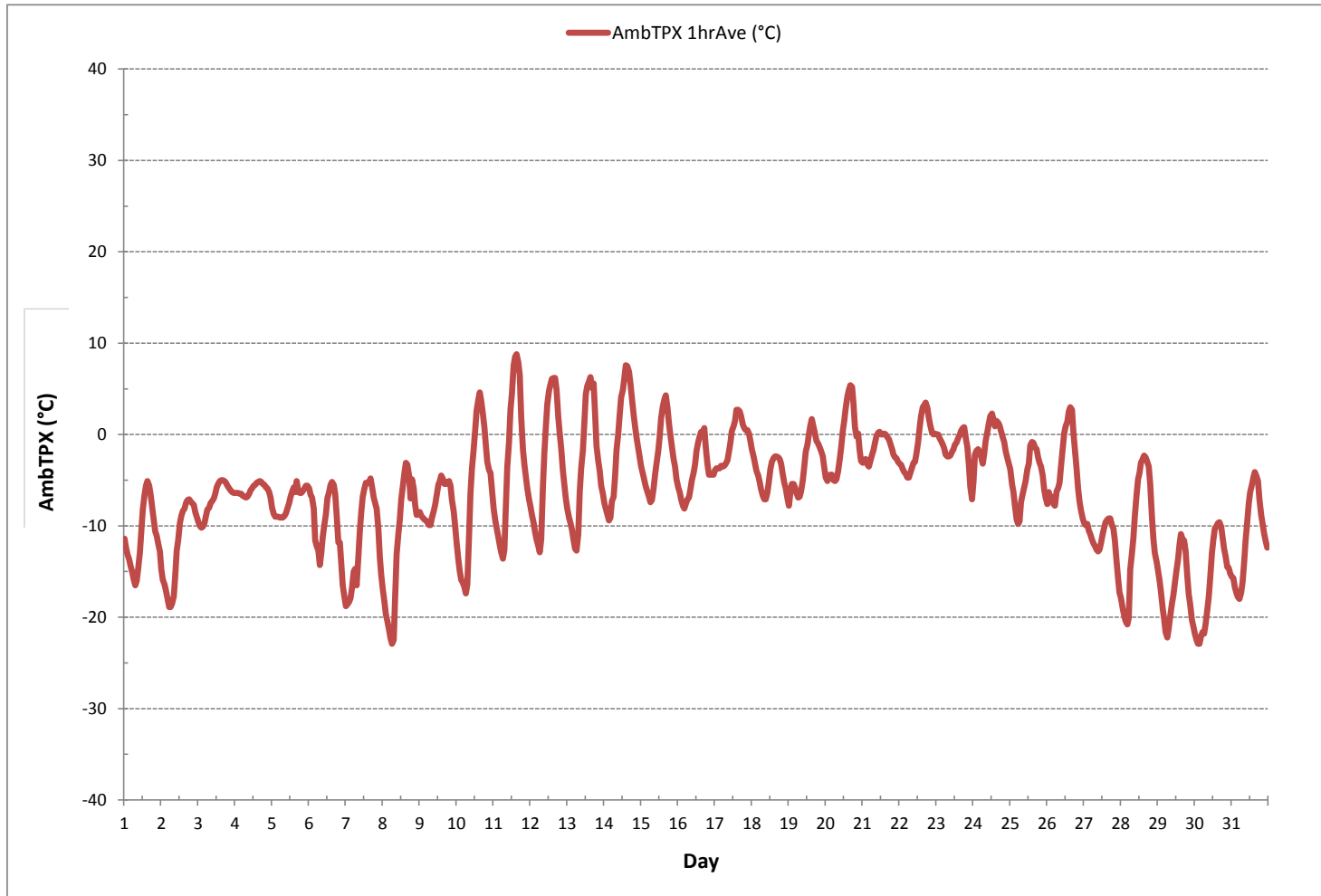
24 HR AVERAGES March 2018



MONTHLY SUMMARY

Summary table with 4 rows and 4 columns: MINIMUM 1-HR AVERAGE (-22.9 °C @ HOUR 6 ON DAY 8), MAXIMUM 1-HR AVERAGE (8.8 °C @ HOUR 15 ON DAY 11), MAXIMUM 24-HR AVERAGE (-0.6 °C ON DAY 14), OPERATIONAL TIME (744 hrs), AMD OPERATION UPTIME (100.0 %), STANDARD DEVIATION (6.3), MONTHLY AVERAGE (-6.3 °C).

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



***APPENDIX II
EQUIPMENT CALIBRATION RESULTS***

SULPHUR DIOXIDE



Thermo 43i Sulphur Dioxide Analyzer Calibration

Date: <u>March 19, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u>	<u>943</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>Cold Lake South</u>	Weather Conditions: <u>A few clouds</u>		
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>10:11</u>	Performed By/Reviewer: <u>Alex Yakupov</u>		<u>Tom Bourque</u>
End Time 24 hr. (mst): <u>14:24</u>	Cal Gas Expiry Date: <u>October 24, 2020</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>		

Analyzer ID# or Serial Number: <u>806528242</u>	Range ppb: <u>500</u>
Last Calibration Date: <u>February 6, 2018</u>	As Found C.F.: <u>1.006</u>
Previous C.F.: <u>1.000</u>	New C.F.: <u>1.001</u>

Calibration Standards: Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u> High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u> Calibrator ID/Expiry Date: <u>Environics id# 5212 expires March 1, 2019</u> Cal Gas Cylinder I.D. #: <u>LL 104225</u> Cal Gas Conc. (ppm): <u>49.2</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>380</td></tr> <tr><td>Mid</td><td>180</td></tr> <tr><td>Low</td><td>90</td></tr> </table>	Point	ppb	High	380	Mid	180	Low	90
Point	ppb								
High	380								
Mid	180								
Low	90								

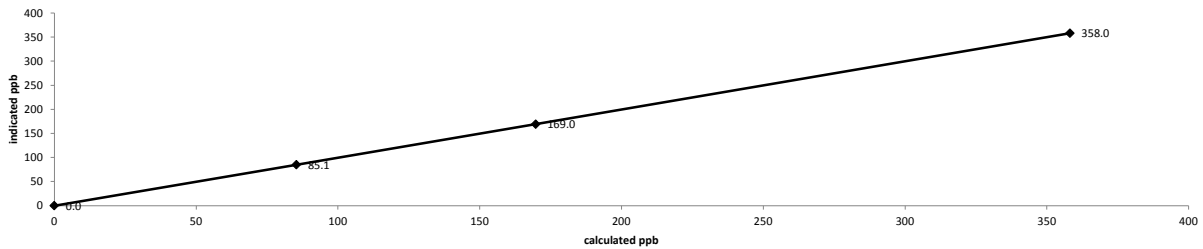
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	5034	0.00	5034	0.0	0.0	n/a
as found high	5000	36.67	5037	358.2	356.0	1.006
adjusted zero	5034	0.00	5034	0.0	0.0	n/a
adjusted high	5000	36.67	5037	358.2	358.0	1.001
mid	5019	17.38	5036	169.8	169.0	1.005
low	5032	8.75	5041	85.4	85.1	1.004
calibrator zero	5034	0.00	5034	0.0	0.0	n/a
Average C.F. =						1.003

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient = <u>1.000</u>	> or = 0.995
Slope = <u>1.000</u>	0.95-1.05
b (Intercept as % of full scale) = <u>0.05%</u>	± 3% F.S.
% change in C.F. from last cal = <u>-0.61%</u>	± 10%

Thermo 43i Sulphur Dioxide Analyzer Calibration

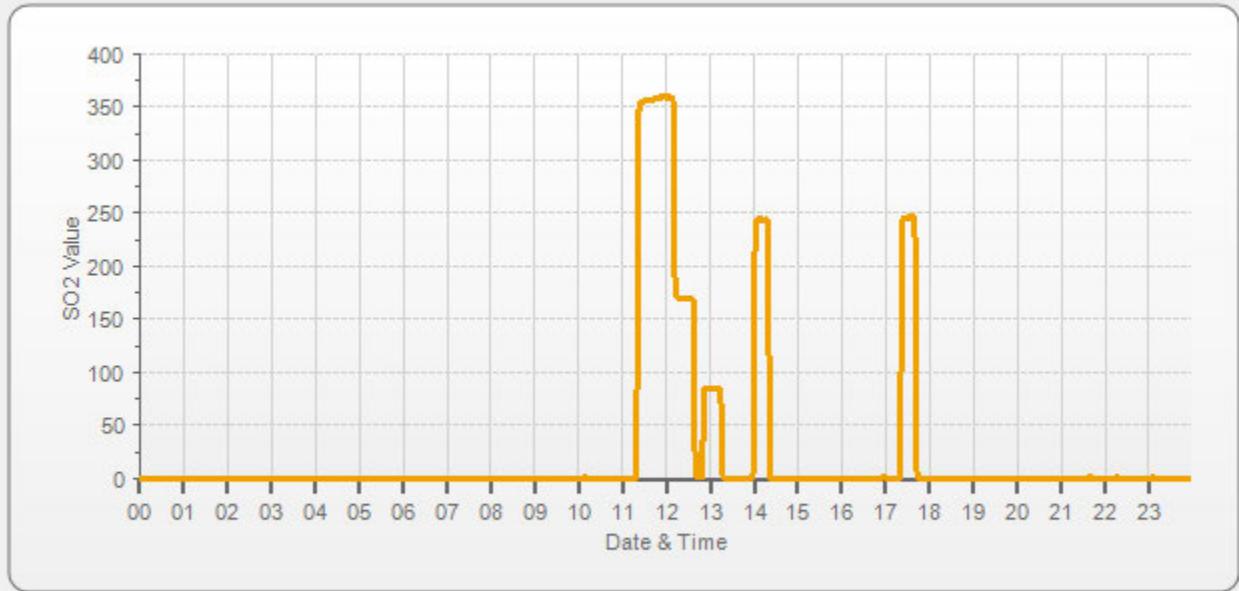


	As found:		As left:
Bkg:	<u>8.4</u>	Bkg:	<u>8.7</u>
Coef:	<u>0.981</u>	Coef:	<u>0.983</u>
Pmt:	<u>-623.8</u>	Pmt:	<u>-623.8</u>
Flash:	<u>770</u>	Flash:	<u>768</u>
Internal:	<u>28.7</u>	Internal:	<u>28.4</u>
Chamber:	<u>45.0</u>	Chamber:	<u>45.2</u>
Perm Oven Gas:	<u>35.00</u>	Perm Oven Gas:	<u>35.00</u>
Perm Oven Heater:	<u>34.24</u>	Perm Oven Heater:	<u>34.24</u>
Pressure:	<u>682.5</u>	Pressure:	<u>681.0</u>
Sample Flow:	<u>0.476</u>	Sample Flow:	<u>0.474</u>
Lamp Intensity:	<u>97</u>	Lamp Intensity:	<u>97</u>
Converter:	<u>n/a</u>	Converter:	<u>n/a</u>
Converter Set:	<u>n/a</u>	Converter Set:	<u>n/a</u>
Averaging Time:	<u>120</u>	Averaging Time:	<u>120</u>
Expected Value:	<u>248.0</u>	Expected Value:	<u>245.0</u>

Comments:

The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.

SO2[ppb] Station: LICA COLD LAKE SOUTH Daily: 18/03/19 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

TOTAL REDUCED SULPHUR



Thermo 450i Total Reduced Sulphur Analyzer Calibration

Date: <u>March 19, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u>	<u>943</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>Cold Lake South</u>	Weather Conditions: <u>A few clouds</u>		
Parameter: <u>Total Reduced Sulphur</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>10:11</u>	Performed By/Reviewer: <u>Alex Yakupov</u>		<u>Tom Bourque</u>
End Time 24 hr. (mst): <u>14:42</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>CDNOVA / Model CDN - 101 / #501</u>		

Analyzer ID# or Serial Number: <u>812728560</u>	Range ppb: <u>100</u>
Last Calibration Date: <u>February 22, 2018</u>	As Found C.F.: <u>0.986</u>
Previous C.F.: <u>0.999</u>	New C.F.: <u>1.000</u>

Calibration Standards: Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u> High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u> Calibrator ID/Expiry Date: <u>Environics id# 4760 expires March 2, 2019</u> Cal Gas Cylinder I.D. #: <u>EY 0000654</u> Cal Gas Conc. (ppm): <u>10.2</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	SO2 Scrubber Check (10 minutes): Start/End Time 24 hr.: <u>11:11 / 11:21</u> SO2 Analyzer Range: <u>500</u> Target Concentration (ppb): <u>380</u> As Found Zero: <u>0.0</u> Analyzer Response (ppb): <u>0.0</u> Zero Corrected Result (ppb): <u>0.0</u>
Point	ppb									
High	78									
Mid	38									
Low	19									

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

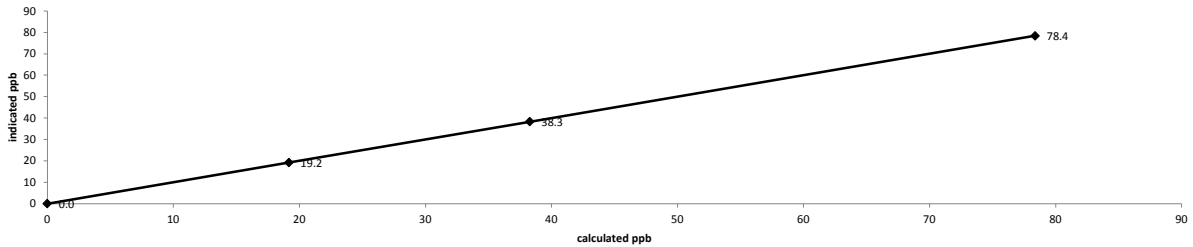
Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7426	0.00	7426	0.0	0.0	n/a
as found high	7372	57.09	7429	78.4	79.5	0.986
adjusted zero	7426	0.00	7426	0.0	0.0	n/a
adjusted high	7372	57.09	7429	78.4	78.4	1.000
mid	7402	27.89	7430	38.3	38.3	1.000
low	7417	13.97	7431	19.2	19.2	0.999
calibrator zero	7426	0.00	7426	0.0	0.0	n/a

Average C.F. = 0.999

Linear Regression/Calibration Results:

	LIMITS	
Correlation Coefficient = <u>1.000</u>	<u>> or = 0.995</u>	
Slope = <u>1.000</u>	<u>0.95-1.05</u>	
b (Intercept as % of full scale) = <u>-0.01%</u>	<u>± 3% F.S.</u>	
% change in C.F. from last cal = <u>1.30%</u>	<u>± 10%</u>	

Thermo 450i Total Reduced Sulphur Analyzer Calibration

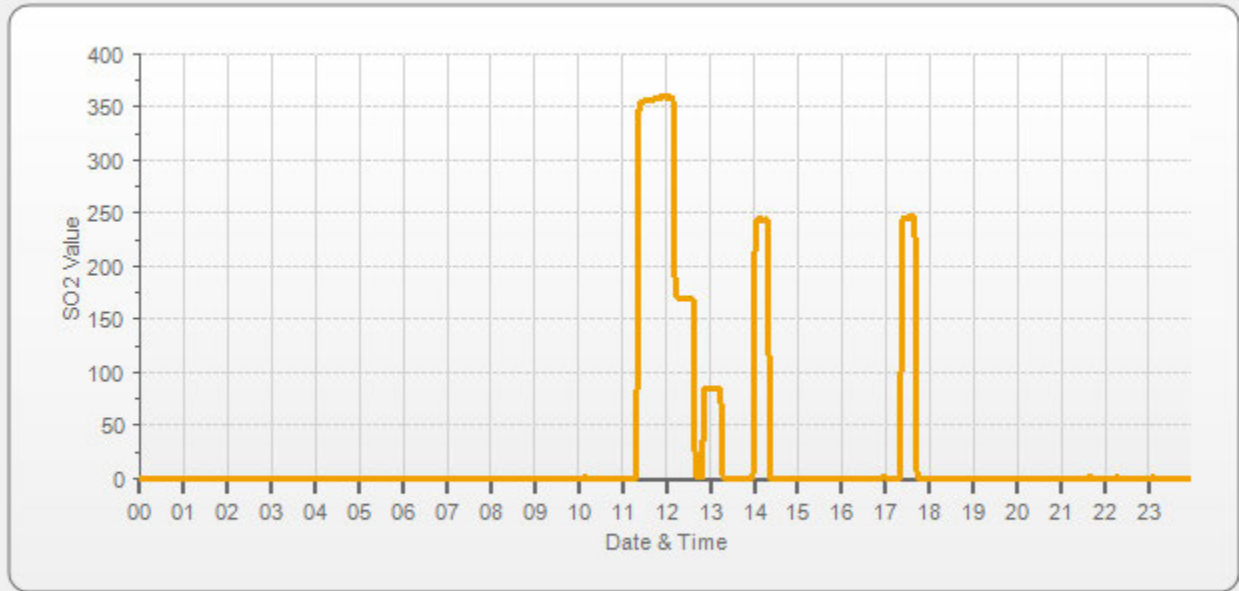


As found: Bkg: <u>14.7</u> Coef: <u>0.925</u> Pmt: <u>-650.5</u> Flash: <u>741</u> Internal: <u>31.7</u> Chamber: <u>45.0</u> Converter Temp: <u>825</u> Converter Set: <u>825</u> Perm Oven Gas: <u>45.00</u> Perm Oven Htr: <u>44.38</u> Pressure: <u>634.3</u> Sample Flow: <u>0.494</u> Lamp Intensity: <u>91</u> Averaging Time: <u>120</u> Expected Value: <u>38.3</u>	As left: Bkg: <u>14.6</u> Coef: <u>0.911</u> Pmt: <u>-650.8</u> Flash: <u>741</u> Internal: <u>31.5</u> Chamber: <u>45.0</u> Converter Temp: <u>825</u> Converter Set: <u>825</u> Perm Oven Gas: <u>45.00</u> Perm Oven Htr: <u>44.37</u> Pressure: <u>634.9</u> Sample Flow: <u>0.493</u> Lamp Intensity: <u>91</u> Averaging Time: <u>120</u> Expected Value: <u>37.8</u>
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Comments:

The analyzer sample inlet filter was changed. The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.

SO2[ppb] Station: LICA COLD LAKE SOUTH Daily: 18/03/19 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	March 20, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	932	millibars
Company/Airshed:	LCA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Cold Lake South	Weather Conditions:	Cloudy/Overcast		
Parameter:	Total Hydrocarbon	Calibration Purpose:	shut down		
Start/End Time 24 hr. (mst):	8:18 / 10:14	Performed By/Reviewer:	Alex Yakupov	Tom Bourque	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 24, 2022		

Analyzer:	ID# or Serial Number:	51CLT-77021-384	Range ppm:	50
	Last Calibration Date:	February 7, 2018	As Found C.F.:	1.024
	Previous Cal High Point C.F.:	0.998	New C.F.:	n/a

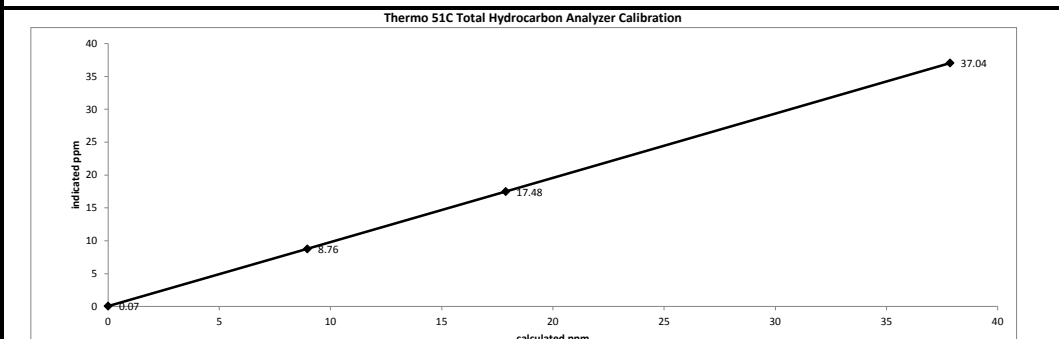
Calibration Standards:	
Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
Calibrator ID/Expiry Date:	Environics id# 4760 expires March 2, 2019
Cal Gas Cylinder I.D. #:	LL165367
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	590.0 207.0
CH ₄ as propane/total CH ₄ equivalents (ppm):	569.3 1159.3
Standard Calibration Points for a Range of: 50 ppm	
Point	Target ppm
High	38
Mid	18
Low	9

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration:	Indicated Concentration:	Correction Factors:
Point	Diluent	Cal Gas	Total	(ppm)	(ppm)	
as found zero	2503	0.00	2503	0.0	0.07	n/a
as found high	2420	81.70	2502	37.85	37.04	1.024
mid	2468	38.66	2507	17.88	17.48	1.027
low	2486	19.36	2505	8.96	8.76	1.031
Average C.F.=						1.027

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	1.023	> or = 0.995
b (Intercept as % of full scale) =	-0.07%	0.90-1.10
% change in C.F. from last cal =	-2.60%	± 3% F.S.
		± 10%



As found:		As left:	
H2 cylinder (psi):	1600	H2 cylinder (psi):	n/a
H2 cylinder reg set (psi):	22	H2 cylinder reg set (psi):	n/a
Span Cylinder (psi):	1300	Span Cylinder (psi):	n/a
Span Cylinder Reg Set (psi):	22	Span Cylinder Reg Set (psi):	n/a
Zero Air Gen Pressure:	40	Zero Air Gen Pressure:	n/a
measurement alarms:	None	measurement alarms:	n/a
service alarms:	None	service alarms:	n/a
cnt:	1446	cnt:	n/a
rng:	1	rng:	n/a
try:	4	try:	n/a
flm:	186.2	flm:	n/a
det:	125.4	det:	n/a
Flame:	186	Flame:	n/a
Filter:	125	Filter:	n/a
Base:	125	Base:	n/a
Sample psi:	06.20	Sample psi:	n/a
Internal Air Pressure:	20	Internal Air Pressure:	n/a
Internal Fuel Pressure:	13	Internal Fuel Pressure:	n/a
Measured Flow:	0.9949	Measured Flow:	n/a
Expected Value:	27.24	Expected Value:	n/a

Comments:
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.

Shutdown calibration was completed to replace a Zero Air generator for maintenance (reason: a purge valve and filter require change)



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date: <u>March 20, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u>	<u>932</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>Cold Lake South</u>	Weather Conditions: <u>Cloudy/Overcast</u>		
Parameter: <u>Total Hydrocarbon</u>	Calibration Purpose: <u>post repair</u>		
Start/End Time 24 hr. (mst): <u>10:45 / 14:16</u>	Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Tom Bourque</u>		
Calibration Method: <u>Gas Dilution</u>	Cal Gas Expiry Date: <u>November 24, 2022</u>		

Analyzer ID# or Serial Number: <u>51CLT-77021-384</u>	Range ppm: <u>50</u>
Last Calibration Date: <u>February 7, 2018</u>	As Found C.F.: <u>n/a</u>
Previous Cal High Point C.F.: <u>n/a</u>	New C.F.: <u>1.000</u>

Calibration Standards:									
Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u>	Standard Calibration Points for a Range of: <u>50 ppm</u>								
High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u>									
Calibrator ID/Expiry Date: <u>Environics id# 4760 expires March 2, 2019</u>	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>Target ppm</th></tr> <tr><td>High</td><td>38</td></tr> <tr><td>Mid</td><td>18</td></tr> <tr><td>Low</td><td>9</td></tr> </table>	Point	Target ppm	High	38	Mid	18	Low	9
Point		Target ppm							
High		38							
Mid		18							
Low	9								
Cal Gas Cylinder I.D. #: <u>LL 165367</u>									
CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm): <u>590.0</u> / <u>207.0</u>									
CH ₄ as propane/total CH ₄ equivalents (ppm): <u>569.3</u> / <u>1159.3</u>									

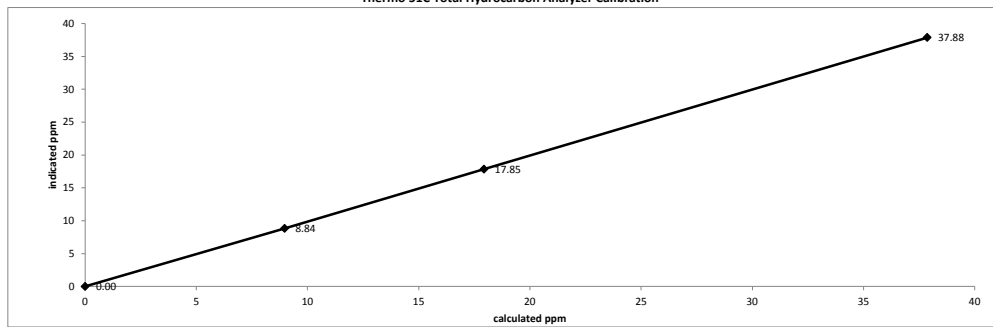
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors
	Diluent	Cal Gas	Total			
adjusted zero	2500	0.00	2500	0.0	0.00	n/a
adjusted high	2424	81.85	2506	37.86	37.88	1.000
mid	2466	38.75	2505	17.93	17.85	1.005
low	2487	19.39	2506	8.97	8.84	1.015
calibrator zero	2500	0.00	2500	0.00	0.00	n/a
Average C.F. =						1.006

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u>	LIMITS
Slope = <u>0.999</u>	> or = 0.995
b (Intercept as % of full scale) = <u>0.15%</u>	0.95-1.05
% change in C.F. from last cal = <u>n/a</u>	± 3% F.S.
	n/a

Thermo 51C Total Hydrocarbon Analyzer Calibration



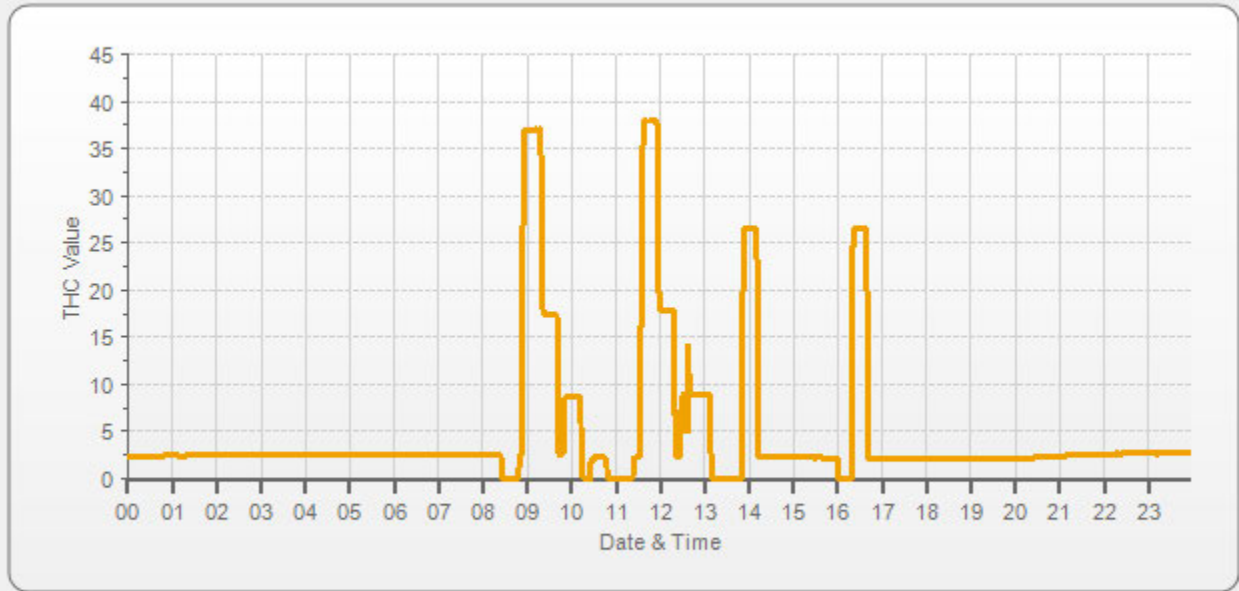
As found:	As left:
H2 cylinder (psi): <u>n/a</u>	H2 cylinder (psi): <u>1600</u>
H2 cylinder reg set (psi): <u>n/a</u>	H2 cylinder reg set (psi): <u>22</u>
Span Cylinder (psi): <u>n/a</u>	Span Cylinder (psi): <u>1300</u>
Span Cylinder Reg Set (psi): <u>n/a</u>	Span Cylinder Reg Set (psi): <u>22</u>
Zero Air Gen Pressure: <u>n/a</u>	Zero Air Gen Pressure: <u>40</u>
measurement alarms: <u>n/a</u>	measurement alarms: <u>None</u>
service alarms: <u>n/a</u>	service alarms: <u>None</u>
cnt: <u>n/a</u>	cnt: <u>2685</u>
rng: <u>n/a</u>	rng: <u>1</u>
try: <u>n/a</u>	try: <u>1</u>
flm: <u>n/a</u>	flm: <u>202.3</u>
det: <u>n/a</u>	det: <u>125.6</u>
Flame: <u>n/a</u>	Flame: <u>202</u>
Filter: <u>n/a</u>	Filter: <u>125</u>
Base: <u>n/a</u>	Base: <u>125</u>
Sample psi: <u>n/a</u>	Sample psi: <u>06.20</u>
Internal Air Pressure: <u>n/a</u>	Internal Air Pressure: <u>20</u>
Internal Fuel Pressure: <u>n/a</u>	Internal Fuel Pressure: <u>13</u>
Measured Flow: <u>n/a</u>	Measured Flow: <u>0.9943</u>
Expected Value: <u>n/a</u>	Expected Value: <u>26.60</u>

Comments:
The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.

Zero Air generator #4027 (LICA) was replaced with Zero Air generator #1812 (LICA). #4027 requires repair (purge valve and filter holder replacement).

THC[ppm] Station: LICA COLD LAKE SOUTH Daily: 18/03/20 Type: AVG 1 Min. [1 Min.]



— THC[ppm]

NITROGEN DIOXIDE



Thermo 42i NO-NO2-NOx Analyzer Calibration

Date: March 19, 2018	Barometer/B.P./units: F.S. 05544 expires January 5, 2019	943	millibars
Company/Airshed: LICA	Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name: Cold Lake South	Weather Conditions: A few clouds		
Start/End Time 24 hr. (mst): 10:11 / 17:45	Calibration Purpose: routine monthly		
G.P.T. to be used for Ozone? Yes with 500 ppb NOx full scale	Performed By/Reviewer: Alex Yakupov Tom Bourque		
Calibration Method: Gas Dilution & Gas Phase Titration	Cal Gas Expiry Date: October 24, 2020		

Analyzer:		Correction Factors:		
ID# or Serial Number: 1505664393	NO =	Previous C.F.:	As Found C.F.:	New C.F.:
Last Calibration Date: February 6, 2018	NO ₂ =	1.001	1.000	1.000
Range ppb: 500	NO _x =	1.000	0.992	1.000
		1.000	0.999	0.999

Calibration Standards:			
Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018	Standard Calibration Points for a Range of: 500 ppb		
High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018	Point	Target NO (ppb)	Target NO ₂ (ppb)
Calibrator ID/Expiry Date: Envirionics id# 5212 expires March 1, 2019	High	380	330
Cal Gas Cylinder I.D. #: LL 104225	Mid	180	245
Cal Gas Conc. (ppm): 51.5 51.6	Low	90	175
	Extra Point #1	n/a	133
	Extra Point #2	n/a	53
			Cc Ozone ?
			<--high ozone
			n/a
			n/a
			<--mid ozone
			<--low ozone

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NO _x	Indicated NO	Indicated NO _x	NO C.F.	NO _x C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5034	0.0	5034	0	0	0.0	0.0	n/a	n/a
as found high	5000	36.7	5037	374.9	375.7	375.0	376.0	1.000	0.999
adjusted zero	5034	0.00	5034	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	5000	36.67	5037	374.9	375.7	375.0	376.0	1.000	0.999
mid	5019	17.38	5036	177.7	178.1	178.0	178.0	0.999	1.000
low	5032	8.75	5041	89.4	89.6	90.0	90.0	0.993	0.995
calibrator zero	5034	0.00	5034	0	0	0.0	0.0	n/a	n/a
Average C.F.=								0.997	0.998

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NO _x	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NO _x reference	5000	36.67	5037	0.0	377.0	377.0	0.0	0.0	0.0	
as found high NO ₂	5000	36.67	5037	260.0	124.0	379.0	255.0	253.0	255.0	0.992
adjusted high NO ₂	5000	36.67	5037	260.0	123.0	377.0	254.0	254.0	254.0	1.000
gpt mid	5000	36.67	5037	130.0	251.0	377.0	126.0	126.0	126.0	1.000
gpt low	5000	36.67	5037	52.0	325.0	377.0	52.0	52.0	52.0	1.000
Average NO ₂ C.F.=									1.000	

Linear Regression/Calibration Results:

	NO	NO _x	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	1.000	0.999	1.000	0.95-1.05
b (Intercept as % of full scale)=	0.06%	0.02%	0.00%	± 3% F.S.
% change in C.F. from last cal=	0.12%	0.09%	0.78%	± 10%
NO ₂ converter efficiency	1.000	1.000	1.000	0.96 to 1.04

As found:	As left:
NO Bkg: 4.0	NO Bkg: 4.1
NO _x Bkg: 4.2	NO _x Bkg: 4.5
NO Coef: 1.005	NO Coef: 1.013
NO ₂ Coef: 0.990	NO ₂ Coef: 1.000
NO _x Coef: 1.000	NO _x Coef: 1.000
PMT: -854.3	PMT: -854.7
Internal: 26.4	Internal: 26.1
Chamber: 50.3	Chamber: 50.1
Cooler: -3.0	Cooler: -2.9
NO ₂ Converter: 323.4	NO ₂ Converter: 324.7
NO ₂ Converter Set: 325	NO ₂ Converter Set: 325.0
Perm Oven Gas: 35.00	Perm Oven Gas: 35.00
Perm Oven Heater: 34.24	Perm Oven Heater: 34.24
Pressure: 178.4	Pressure: 176.3
Flow: 0.766	Flow: 0.765
Ozonator Flow: OK	Ozonator Flow: OK
Expected Value NO: 2	Expected Value NO: 2
Expected Value NO ₂ : 272	Expected Value NO ₂ : 266
Expected Value NO _x : 274	Expected Value NO _x : 268

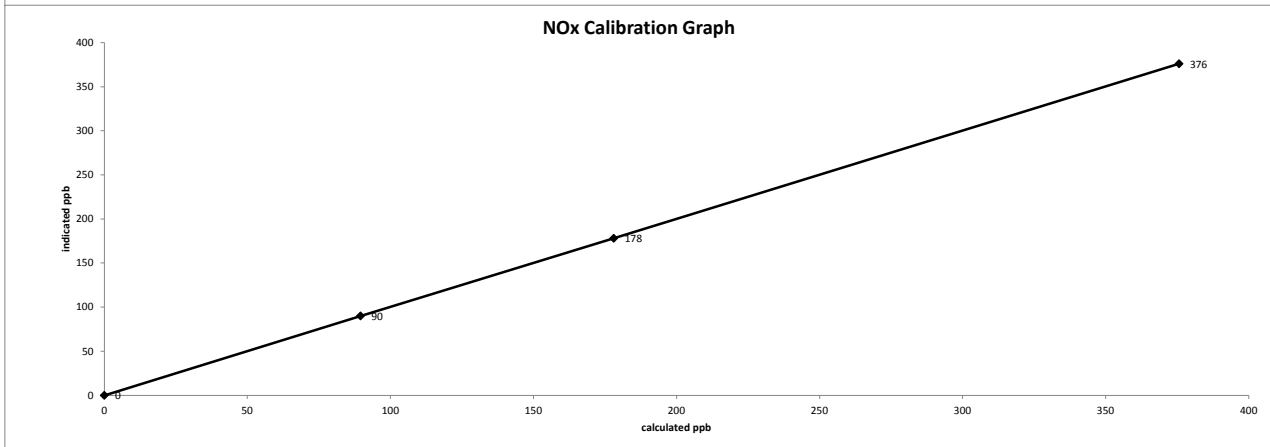
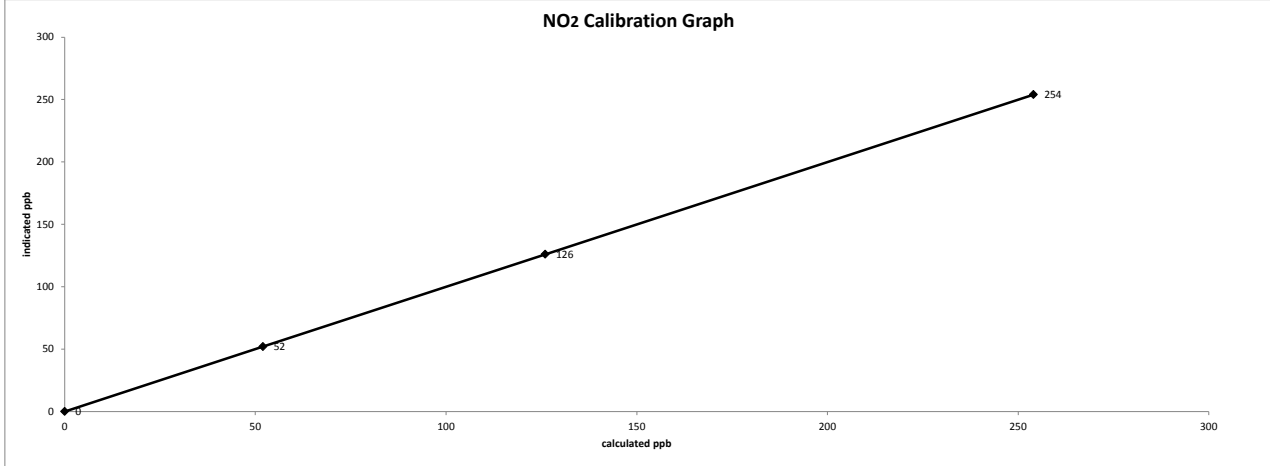
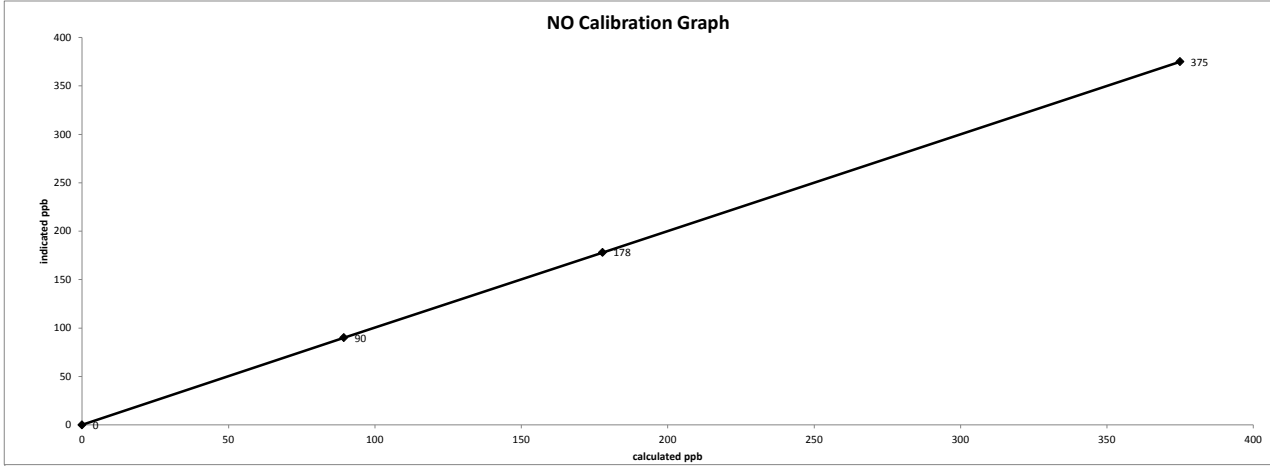
Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.
 The analyzer cooling fan filter(s) were cleaned.

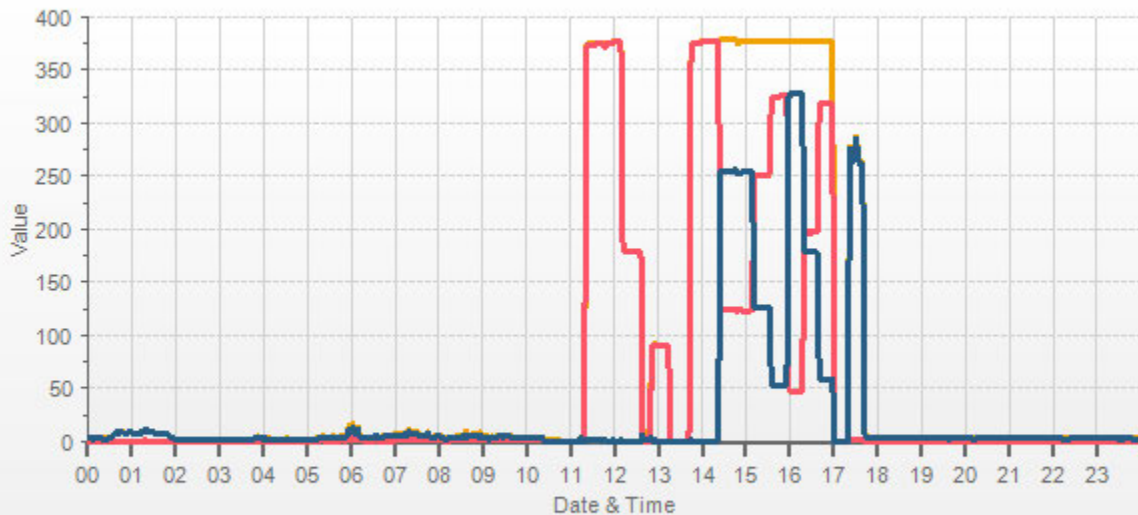
15:56 - second GPT for O3 calibration was started (ppb) : High O3 = 340 => NO drop = 329 ; Mid O3 = 185 => NO drop = 180; Low O3 = 60 => NO drop = 59.

Date: March 19, 2018
Company/Airshed: LICA
Location/Station Name: Cold Lake South

Start/End Time 24 hr. (mst): 10:11 / 17:45
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

Thermo 42i NO-NO2-NOx Analyzer Calibration





— NOx[ppb] — NO[ppb] — NO2[ppb]

OZONE



Thermo 49i Ozone Analyzer Calibration

Date: March 20, 2018 Company/Airshed: LICA Location/Station Name: Cold Lake South Start/End Time 24 hr. (mst): 8:18 / 13:07 Ozone Calibration Method: Direct G.P.T. G.P.T. Date: March 19, 2018	Barometer/B.P./units: F.S. 05544 expires January 5, 2019 932 millibars Thermometer/Station Temp: F.S. 170286131 expires April 19, 2019 22 °C Weather Conditions: Cloudy/Overcast Calibration Purpose: routine monthly Performed By/Reviewer: Alex Yakupov Tom Bourque Cal Gas Expiry Date: October 24, 2020
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Analyzer: ID# or Serial Number: 700419951 Last Calibration Date: February 7, 2018 Previous Cal High Point C.F.: 1.000	Ozone Range ppb: 500 As Found C.F.: 1.006 New C.F.: 1.000
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Calibration Standards: Low Flow Meter ID/Expiry Date: Defender Low 152019 expires December 13, 2018 High Flow Meter ID/Expiry Date: Defender High 148944 expires December 13, 2018 Calibrator ID/Expiry Date: Envionics id# 5212 expires March 1, 2019 Cal Gas Cylinder I.D. # : LL 104225	<table border="1" style="margin: auto;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-100 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-100 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-100 ppb								

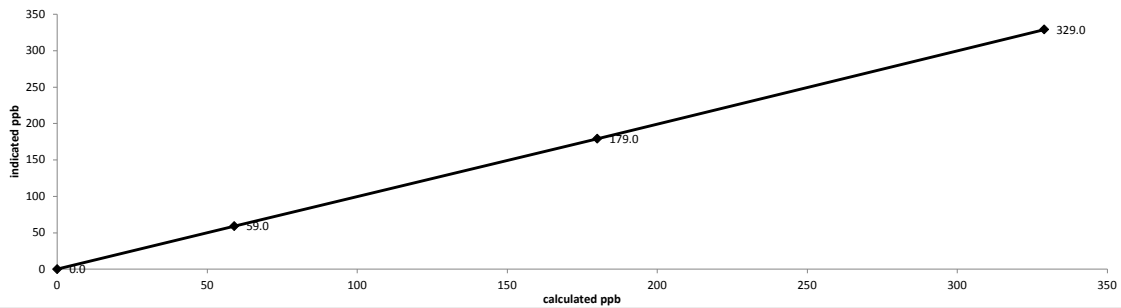
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	329.0	329.0	327.0	1.006
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	329.0	329.0	329.0	1.000
mid	5000	5000	180.0	180.0	179.0	1.006
low	5000	5000	59.0	59.0	59.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F.=						1.002

Linear Regression/Calibration Results:

Correlation Coefficient = 1.000 Slope = 1.001 b (Intercept as % of full scale)= 0.03% % change in C.F. from last cal= -0.61%	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
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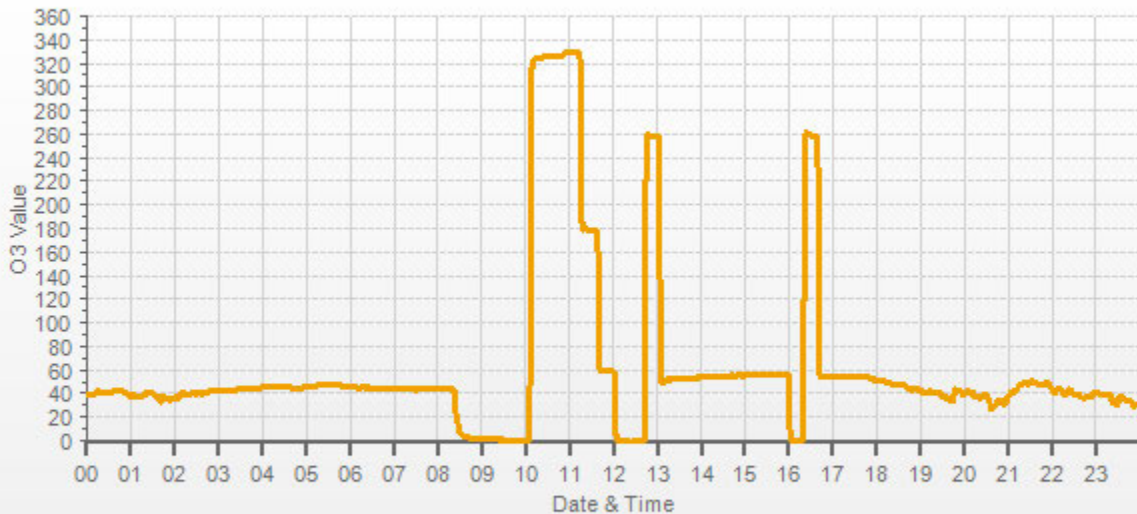
Thermo 49i Ozone Analyzer Calibration



As found: O3 Bkg: 0.1 O3 Coef: 0.997 Photo Lamp: 9.6 O3 Lamp: 9.0 Bench: 28.4 Bench Lamp: 53.5 O3 Lamp: 67.3 Pressure: 704.4 Cell A lpm: 0.714 Cell B lpm: 0.755 O3 ppb: 4.0 Cell A ppb: 4.3 Cell B ppb: 3.8 Cell A int: 82756 Cell B int: 83662.0 Expected Value: 271.0	As left: O3 Bkg: 0.1 O3 Coef: 1.005 Photo Lamp: 9.6 O3 Lamp: 9.0 Bench: 28.2 Bench Lamp: 53.4 O3 Lamp: 67.3 Pressure: 704.1 Cell A lpm: 0.714 Cell B lpm: 0.754 O3 ppb: -0.1 Cell A ppb: 3.1 Cell B ppb: -3.1 Cell A int: 82737 Cell B int: 83652.0 Expected Value: 257.0
---	--

Comments:

The analyzer sample inlet filter was changed.
 The analyzer cooling fan filter(s) were cleaned.
 The manifold blower was found to be working normally.



— O3[ppb]

PARTICULATE MATTER 2.5

SHARP 5030 Monitor Monthly Audit

Date:	March 26, 2018	Performed By/Reviewer:	Alex Yakupov
Company:	LICA	Start Time (mst):	11:59
Station Name/Location:	Cold Lake South	End Time (mst):	12:27
Previous Audit Date:	February 22, 2018	Calibration Purpose:	routine monthly
Parameter:	PM 2.5	Weather Conditions:	Mainly sunny

SHARP Information and Status:			
Serial Number:	CM-2209	Status:	0.00
Approx. % Tape remaining:	3/5	Error Code:	0.00

Reference Standards/I.D./Expiry Date:	
High Flow:	Airmetrics/Chinook High Maxxam ID #2 expires March 24, 2018
Digital Manometer:	Dwyer 475 Mark III id# 1 expires April 24, 2018
Temperature:	F.S. 170286131 expires April 19, 2019
Pressure:	F.S. 05544 expires December 5, 2018
RH:	F.S. 170286131 expires April 19, 2019

As found temperature and pressure:			
Tolerance °C +/-	5	Tolerance mmHg +/-	10
SHARP T1 (°C):	1.0	SHARP P3 (mmHg):	704.30
Reference (°C):	0.5	Reference (mmHg):	704.30
Difference (°C):	-0.5	Difference (mmHg):	0.0

As left temperature and pressure (same as above if as found adequate):			
Tolerance °C +/-	5	Tolerance mmHg +/-	10
SHARP T1 (°C):	1.0	SHARP P3 (mmHg):	704.30
Reference (°C):	0.5	Reference (mmHg):	704.30
Difference (°C):	-0.5	Difference (mmHg):	0.0

As found flows:			
SHARP Airflow l/hr	1000.00	Tolerance lpm +/-	5%
Pump Voltage (%)	47.50	SHARP Airflow (lpm)	16.67
		Reference Airflow (lpm)	n/a
		Difference (%)	n/a

As left flows (same as above if as found adequate):			
Targets: 1000 l/hr / <90%			
SHARP Airflow l/hr	1000.00	Tolerance lpm +/-	5%
Pump Voltage (%)	47.50	SHARP Airflow (lpm)	16.67
		Reference Airflow (lpm)	n/a
		Difference (l/min)	n/a

As found relative humidity:		As left relative humidity (same as "as found" if adequate):	
Tolerance % +/-	3	Tolerance % +/-	3
Sharp RH (%):	n/a	Sharp RH (%):	n/a
Reference RH (%):	n/a	Reference RH (%):	n/a
Difference:	n/a	Difference:	n/a

Inlet Assembly:		
Inlet Head/Sharp Cut	Yes/No?	If no, give reason:
Cleaned:	yes	

Comments:

The flow was audited during the March 2018 AEP station audit.

WIND SYSTEM



Met One Instruments

Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H Sensor Serial No.: F1644
 Sensor Output Swing: 0V - 1.0V Sensor Output Range: 0 - 50.0 MPS
 Customer: Maxxam Analytics Sales Order No.: 125713
 Tested per PO: P00000003392 Calibration Date: 11/09/2017
 Calibrated by: David Frith *DF* QC Inspection: *Dyann Paulsen*

Instrument Condition Within Tolerance: As Found As Left
 Corrective Action: No Adjustment Adjust Repair
 Preventative Maintenance

As Found Test Date: N/A As Left Test Date: 11/09/2017

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.

All Work Performed per Customer Purchase Order Requirements.

Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Voltage Accuracy	Time Base Accuracy
Data Acquisition	Campbell Scientific	CR1000	6569	4/06/2015	4/06/2018	+/- 3mV	< 6 ppm
NIST Cupset	Met One Instruments	170-41	3309	1/26/2017	1/26/2022	Accuracy < 0.15 mph or 1% WS	

Environmental Data: Temperature 65 to 80 Deg F Vibration none
 Humidity 20 to 70% Radiation none

Firmware Version: 3194-01 R2.62

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements

CALIBRATORS

Company: Maxxam **Operator:** Chris W

Calibrator:		Flow Measurement Device:	
Make/Model	<u>Envionics 6100</u>	Make/Model	<u>Mesa Defender 530</u>
Serial Number	<u>5212</u>	Serial Number	<u>L-153351 H-152571</u>
Last Verification Date	<u>February 2017</u>	Temperature (°C)	<u>24.0 C</u>
NO Cylinder S/N	<u>EY0000715</u>	Barometric Pressure	<u>702 mmHg</u>
NO [PPM]	<u>50.7</u>	NOx [PPM]	<u>50.8</u>
Expiry Date	<u>May 2021</u>		

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
5004	77.2	0.7822	0.7837	0.7769	0.0006	0.7774	-1%	-1%
5018	37.7	0.3809	0.3817	0.3777	0.0005	0.3782	-1%	-1%
5012	18.8	0.1902	0.1905	0.1884	-0.0002	0.1885	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 0.9934	0.90-1.10	m (Slope)= 0.9921
b (Intercept % of FS)= -0.0332	± 3% F.S.	b (Intercept % of FS)= -0.0277

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO ₂	% Diff. Limit
5004	0.500	0.4846	0.2920	0.4797	0.7717	-1%	± 10%
5004	0.280	0.2731	0.5035	0.2713	0.7747	-1%	± 10%
5004	0.100	0.0958	0.6808	0.0962	0.7770	0%	± 10%
Absolute Average Percent Difference						1%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9880	0.90-1.10
b (Intercept % of FS)= 0.1153	± 3% F.S.

AENV Standards	NO_x Analyzer
Audit Calibrator	Make/Model <u>Teco 42i</u>
Make/Model <u>Teco 146i</u>	Serial/AMU Number <u>AMU 1868</u>
Serial/AMU Number <u>AMU 1809</u>	Last Calibration Date <u>March 1, 2018</u>
SRM Gas Cylinder No. <u>APEX1170572</u>	Full Scale (ppm) <u>1.0</u>
Cylinder Conc. (ppm) <u>49.99</u>	Cylinder Gas Expiry Date <u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark Date: March 1, 2018

Operator Signature: *Chris W* Location: McIntyre Center Edmonton

Company: Maxxam Operator: Chris W

Calibrator:				Flow Measurement Device:			
Make/Model	<u>Envronics 6100</u>			Make/Model	<u>Mesa Defender 530</u>		
Serial Number	<u>4760</u>			Serial Number	<u>L-153351 H-152571</u>		
Last Verification Date	<u>February 2017</u>			Temperature (°C)	<u>23.0 C</u>		
NO Cylinder S/N	<u>EY0000715</u>			Barometric Pressure	<u>704 mmHg</u>		
NO [PPM]	<u>50.7</u>	NOx [PPM]	<u>50.8</u>				
Expiry Date	<u>May 2021</u>						

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
4935	77.0	0.7911	0.7926	0.7830	0.0017	0.7846	-1%	-1%
4951	37.5	0.3840	0.3848	0.3808	-0.0001	0.3806	-1%	-1%
4938	18.9	0.1941	0.1944	0.1915	0.0003	0.1918	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9901	0.90-1.10		m (Slope)=	0.9901
b (Intercept % of FS)=	-0.0092	± 3% F.S.		b (Intercept % of FS)=	-0.0320

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas		
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO ₂	% Diff. Limit	
4935	0.500	0.4912	0.2965	0.4844	0.7809	-1%	± 10%	
4935	0.280	0.2755	0.5122	0.2729	0.7851	-1%	± 10%	
4935	0.100	0.0977	0.6900	0.0991	0.7891	1%	± 10%	
Absolute Average Percent Difference							1%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO ₂		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9836	0.90-1.10	
b (Intercept % of FS)=	0.1675	± 3% F.S.	

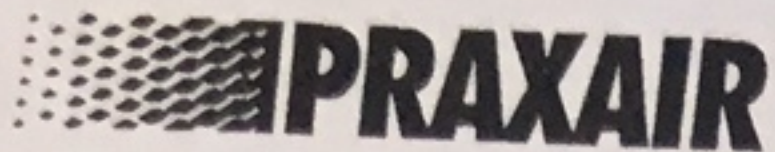
AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 2, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark
Operator Signature: *Chris W*

Date: March 2, 2018
Location: McIntyre Center Edmonton

CALIBRATION GASES



Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Tel: (323) 585-2154 Fax: (714) 542-6689
 PGVPID: F22017

DocNumber: 000116115

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR PKG EDMONTON PLT 8
 9501 34TH ST
 EDMONTON AB T6B 2X

Praxair Order Number: 45314542
 Customer P. O. Number: 582-277
 Customer Reference Number:

Fill Date: 10/12/2017
 Part Number: NI NO50MS2E-AQ
 Lot Number: 70086728507
 Cylinder Style & Outlet: AQ CGA 660
 Cylinder Pressure & Volume: 2000 psig 82 cu. ft.

Certified Concentration:

Expiration Date:	10/24/2020	NIST Traceable
Cylinder Number:	LL104225	Analytical Uncertainty:
51.5 ppm	NITRIC OXIDE	± 0.7 %
49.2 ppm	SULFUR DIOXIDE	± 1 %
Balance	NITROGEN	

NOx = 51.6 ppm

NOx for Reference Only

Certification Information: Certification Date: 10/24/2017 Term: 36 Months Expiration Date: 10/24/2020

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: NITRIC OXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 51.5 ppm
 Instrument Used: Thermo Electron 42i-LS S/N 1030645077
 Analytical Method: Chemiluminescence
 Last Multipoint Calibration: 10/14/2017

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC363145
 Ref. Std. Conc: 50.79 ppm
 Ref. Std. Traceable to SRM #: vs. 1683b
 SRM Sample #: 45.-V-42
 SRM Cylinder #: CAL017897

First Analysis Data:		Date: 10/17/2017	
Z: 0	R: 50.8	C: 51.5	Conc: 51.49
R: 50.8	Z: 0	C: 51.6	Conc: 51.59
Z: 0	C: 51.6	R: 50.8	Conc: 51.59
UOM: ppm	Mean Test Assay:		51.557 ppm

Second Analysis Data:		Date: 10/24/2017	
Z: 0	R: 50.8	C: 51.4	Conc: 51.39
R: 50.8	Z: 0	C: 51.5	Conc: 51.49
Z: 0	C: 51.4	R: 50.8	Conc: 51.39
UOM: ppm	Mean Test Assay:		51.423 ppm

2. Component: SULFUR DIOXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 49.2 ppm
 Instrument Used: Ametek 921CE S/N AW-921-S321
 Analytical Method: Ultraviolet Absorption
 Last Multipoint Calibration: 10/13/2017

Reference Standard Type: NTRM
 Ref. Std. Cylinder #: CC72593
 Ref. Std. Conc: 48.58 ppm
 Ref. Std. Traceable to SRM #: n/a
 SRM Sample #: 12070103
 SRM Cylinder #: N/A

First Analysis Data:		Date: 10/17/2017	
Z: 0	R: 48.2	C: 48.8	Conc: 49.151
R: 48.2	Z: 0	C: 48.8	Conc: 49.151
Z: 0	C: 48.9	R: 48.3	Conc: 49.251
UOM: ppm	Mean Test Assay:		49.184 ppm

Second Analysis Data:		Date: 10/24/2017	
Z: 0	R: 48.2	C: 48.7	Conc: 49.084
R: 48.2	Z: 0	C: 48.8	Conc: 49.185
Z: 0	C: 48.8	R: 48.2	Conc: 49.185
UOM: ppm	Mean Test Assay:		49.151 ppm

Analyzed by:

Henry Koung

Certified by:

Amalia Real

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-334CGA

Company: Maxxam **Operator's Name:** Russell Kirchner

Cylinder #: EY0000654 Concentration PPM: 10.2 Tolerance(%): 2 Certified By: Praxair

Expiry Date: June 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMU 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.0 C</u>
Gas Type: <u>H2S</u> Conc. <u>20.43</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CAL015584</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:

Make/Model: Teco 450i Serial/AMU Number: 1980

Instrument Settings: Zero: 16.6 Span: 1.231 Range: 0.1

Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (scm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.00752	132.895	10.2
5050	38.0	0.0764	0.00752	132.895	10.2
5050	17.8	0.0355	0.00352	283.708	10.1
5023	9.1	0.0182	0.00181	551.978	10.0
Average Cylinder Concentration:					10.1

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark Date: October 19, 2016

Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

CH₄ / C₃H₈ Cylinder Gas

File No. 2015-029CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: LL165367 **Conc CH₄ (PPM)** 590/207 **Tolerance (%)** 2 **Certified By:** Praxair

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&R MFC 201</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1691</u>			Serial Number	<u>AMU 1650</u>
Last Verification Date	<u>May 21, 2015</u>			Temp. °C	<u>24.0 C</u>
Gas Type	<u>CH₄</u>	Conc.	<u>999.2</u>	B.P.	<u>703 mmhg</u>
Cylinder Number	<u>D751932</u>				
Gas Type	<u>C₃H₈</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF0037998</u>				

Reference Analyzer:

Make/Model Teco 55C Serial/AMU Number: 1643
Instrument Settings Zero: N/A Span: N/A Range: 20
Last Calibration: Date: May 21/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
		CH ₄	C ₃ H ₈			CH ₄	C ₃ H ₈
Dilution	Gas						
<u>2600</u>	<u>0.0</u>	<u>0.00</u>	<u>0.00</u>	0.02005	49.883	602	206
<u>2569</u>	<u>51.5</u>	<u>12.06</u>	<u>11.37</u>	<u>0.02005</u>	<u>49.883</u>	<u>602</u>	<u>206</u>
<u>3549</u>	<u>22.3</u>	<u>3.77</u>	<u>3.57</u>	<u>0.00628</u>	<u>159.148</u>	<u>600</u>	<u>207</u>
<u>3523</u>	<u>10.4</u>	<u>1.77</u>	<u>1.70</u>	<u>0.00295</u>	<u>338.750</u>	<u>600</u>	<u>209</u>
Average Cylinder Concentration:						600	207

<u>CH₄</u>	<u>C₃H₈</u>
Previous Stated Concentration PPM: <u>590</u>	<u>207</u>
Percent variance from Stated: <u>1.8</u>	<u>0.2</u>

Cylinder gas tolerances based on CH₄ only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
< =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark Date: May 21, 2015
Operator Signature: _____ Location: McIntyre Center Edmonton

***APPENDIX III
AEP AUDIT RESULTS***

STATION AUDIT

File No. 2017 - 568A/573A & 583A

Date: March 14, 2018

Performed by: Shea Beaton

Station

Name: Cold Lake South

Location: Cold Lake

Facility/Zone: Lica

Operator: Maxxam

Temp: 23.5

Barometric Press: 712mmHg

Location

Latitude N 54°24'50"

Longitude W 110°13'55"

Elevation 530

Status of Site Documentation On-Site Complete

Status of Network Documentation Complete

Status of QAP Last Audited in June 2017

Manifold Material Glass

Manifold Condition Good

Meteorological

	Observed	Audit Value
Wind Speed Direction	<u>6km/h @ 95deg</u>	<u>5-10km/h E</u>
Station Temperature	<u>23</u>	<u>21.6</u>
Relative Humidity	<u>36.3%</u>	<u>36.6%</u>
Ambient Temperature	<u>7.8</u>	<u>8</u>
BP	<u>NA</u>	<u>NA</u>
Precipitation	<u>NA</u>	<u>NA</u>

Remarks:

-Nox inlet filter holder made of anadized aluminum withbrass fittings - incompatable material needs to be stainless. A stainless filter holder is in the station for that analyzer.

SO₂ ANALYZER AUDIT

File No. 2017-568A

Date: March 14, 2018

Performed by: Shea Beaton

Station

Name: Cold Lake South

Location: Cold Lake

Facility/Zone: Lica

Operator: Maxxam

Temp. 23.5

Barometric Press. 712mmHg

Monitor

Make/Model: Thermo 43i Serial No: 1771

Inlet flow (sccm): 0.473 Full Scale Range ppm: 1.0

Last cal. Date: February 6, 2018 Old Correction Factor: 1.001

Zero/Bkg 8.4

Span Coef 0.981

Calibrator

Calibration Method: GAS DILUTION Make/Model: R&R MFC 201

Cylinder #: EX0012544 AMU #: 1698

CGA Date: 15-Nov-17 SO₂ Concentration PPM: 51.1

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
5045	9.0	5054	0.0000	0.0000		
5105	37.8	5143	0.3756	0.3852	3%	± 10%
5075	18.2	5093	0.1826	0.1886	3%	± 10%
5076	9.4	5085	0.0945	0.0982	4%	± 10%
Absolute Average Percent Difference					3%	

Linear Regression Analysis:

$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 1.0248

b (Intercept as % of full scale)= 0.0795

LIMITS

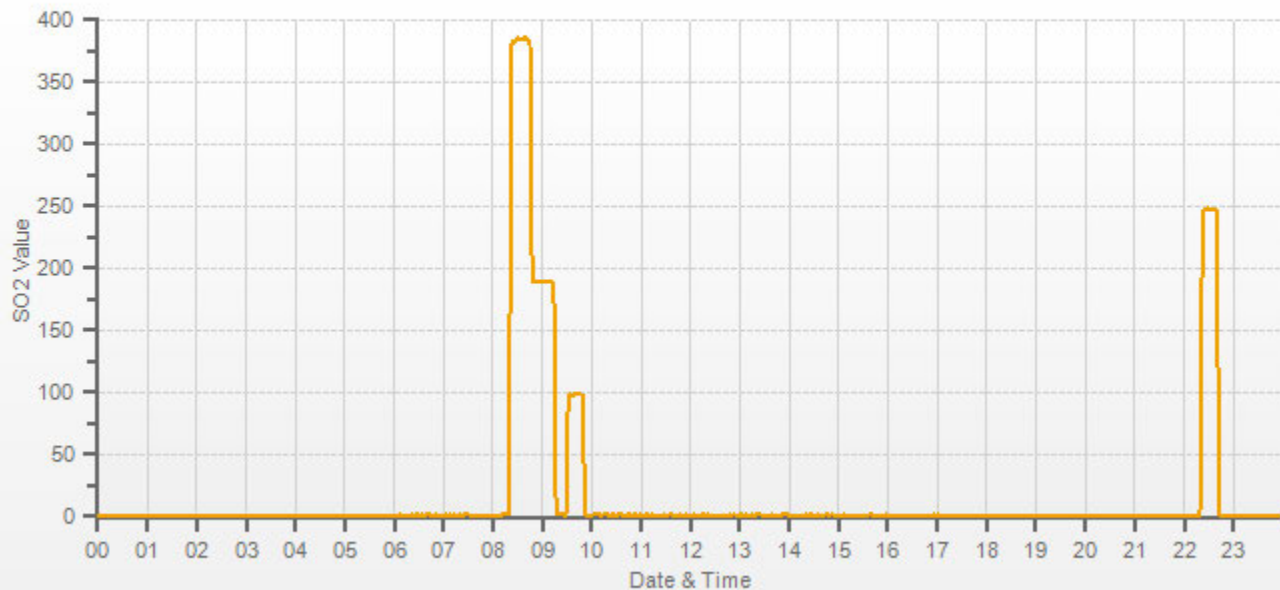
≥ **0.995**

0.90-1.10

± **3% F.S.**

Remarks:

— SO2[ppb]



TRS ANALYZER AUDIT

File No. 2017-569A

Date: March 14, 2018

Performed by: Shea Beaton

Station

Name: Cold Lake South

Location: Cold Lake

Facility/Zone: Lica

Operator: Maxxam

Temp. 23.5

Barometric Press. 712mmHg

Monitor

Make/Model: Thermo 450i Serial No: AMU 1767

Inlet flow (sccm): 489 Full Scale Range ppm: 0.1

Last cal. Date: February 22, 2018 Old Correction Factor: 0.999

Zero/Bkg 14.7

Span Coef 0.925

Calibrator

Calibration Method: GAS DILUTION Make/Model: R&R MFC 201

Cylinder #: EX0009231 AMU #: 1698

CGA Date: 9-Aug-17 H₂S Concentration PPM: 9.99

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
5054	0.0	5054	0.0000	0.0002		
5104	38.9	5143	0.0756	0.0784	3%	± 10%
5076	16.8	5093	0.0330	0.0346	4%	± 10%
5077	8.5	5085	0.0167	0.0174	3%	± 10%
Absolute Average Percent Difference					4%	

Linear Regression Analysis:

$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 1.0355

b (Intercept as % of full scale)= 0.2366

LIMITS

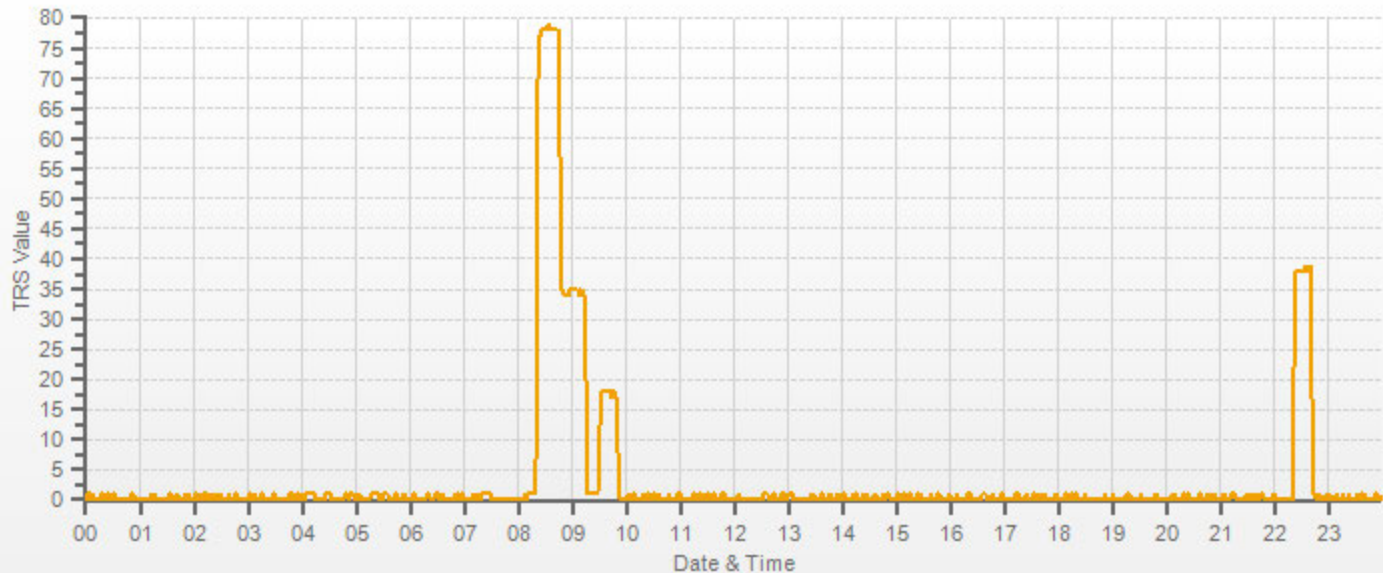
≥ **0.995**

0.90-1.10

± **3% F.S.**

Remarks:

— TRS[ppb]



HC ANALYZER AUDIT

File No. 2017-572A

Date: March 14, 2018 Performed by: Shea Beaton

Station

Name: Cold Lake South Location: Cold Lake
 Facility/Zone: Lica Operator: Maxxam
 Temp. 23.5 Barometric Press. 712mmHg

Monitor

Make/Model: Thermo 51iLT Serial No: 51CLT-77021-384
 Inlet flow (sccm): 9.7psi Full Scale Range ppm: 50.0
 Last cal. Date: February 7, 2018 Old Correction Factor: 0.998

Calibrator

Calibration Method: Gas Dilution
 Make/Model: R&R MFC 201 AMU #: 1698
 HC cylinder #: FF50323 HC concentration ppm: 1988.8

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
3553	0.0	3553	0.00	0.1		
3557	58.1	3615	31.96	31.6	-1%	± 10%
3556	25.9	3582	14.38	14.2	-2%	± 10%
3566	13.1	3579	7.28	7.3	-1%	± 10%
Absolute Average Percent Difference					2%	

Linear Regression Analysis:

$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

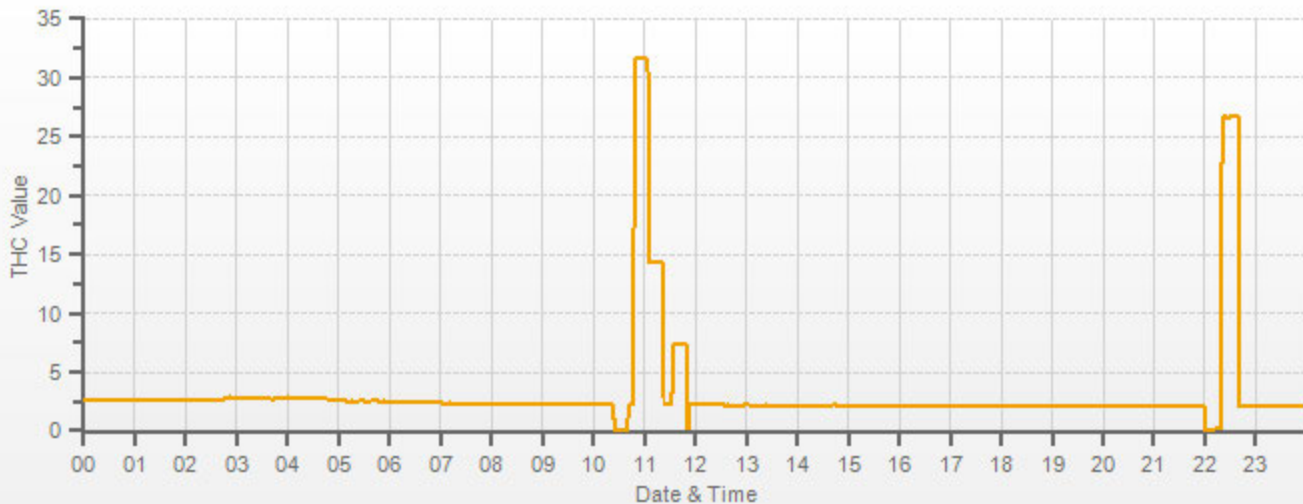
Correlation Coeff.= 1.0000
 m (Slope)= 0.9852
 b (Intercept as % of full scale)= 0.1803

LIMITS
≥ 0.995
0.90-1.10
± 3% F.S.

Remarks:

THC[ppm] Station: LICA COLD LAKE SOUTH Daily: 18/03/14 Type: AVG 1 Min. [1 Min.]

— THC[ppm]



NO-NOx-NO2 Analyzer Audit

File No. 2017-570A

Date: March 14, 2018 Performed by: Shea Beaton

Station:

Name: Cold Lake South Location: Cold Lake Operator: Maxxam
Facility/Zone: Lica Temp. 23.5 BP: 712mmHg

Monitor:

Make/Model: Thermo 42i Serial No. AMU 2001
Inlet flow (scm): 783 Range ppm: 0.5
Last cal. Date: February 6, 2018 Old CF: NO: 1.001
NOx: 1.000
NO2: 1.000

NO Bkg 4.0
NOx Bkg 4.2
NO Coef 1.005
NOx Coef 0.990
NO2 Coef 1.000

Calibration Method: Gas Dilution / GPT

Calibrator: Make/Model: Sabio 2010 AMU# 1778
NO cylinder # EX0012160 NO conc. ppm 52.4 NOx conc. ppm 52.7
CGA Date 10-Aug-17

Calibrator Flows			Calc. Conc.		Indicated Concentration		% Difference vs Audit Gas	
Air	Gas	Total	NO (ppm)	NOx (ppm)	NO (ppm)	NOx (ppm)	NO	NOx
5027	0.0	5027	0.0000	0.0000	0.000	0.001	Limit ± 10%	
5028	38.8	5067	0.4012	0.4035	0.404	0.405	1%	0%
5039	19.0	5058	0.1968	0.1980	0.202	0.203	2%	2%
5051	9.3	5060	0.0963	0.0969	0.100	0.101	3%	4%
Absolute Average Percent Difference							2%	2%

Linear Regression Analysis:

y=mx+b (where x=calculated concentration, y=indicated concentration)

	NO	NOx	NO ₂	LIMITS
Correlation Coeff.=	<u>0.9999</u>	<u>0.9999</u>	<u>1.0000</u>	≥ 0.995
m (Slope)=	<u>1.0041</u>	<u>0.9996</u>	<u>1.0110</u>	0.90-1.10
b (Intercept as % of full scale)=	<u>0.3824</u>	<u>0.5840</u>	<u>-0.0682</u>	± 3% F.S.

O ₃ Setting	Flow Rate	Indicated Conc. (ppm)			NO Decrease	NO ₂ Increase	% Difference vs Audit Gas	
		NO	NOx	NO ₂				
0.000	5067	0.401	0.403	0.002	0.401	0.403	0.002	%Dif Limit
0.555	5067	0.109	0.406	0.297	0.292	0.295	1%	± 10%
0.350	5067	0.234	0.404	0.171	0.167	0.169	1%	± 10%
0.175	5067	0.339	0.404	0.065	0.062	0.063	1%	± 10%
Absolute Average Percent Difference							1%	

Converter Efficiency

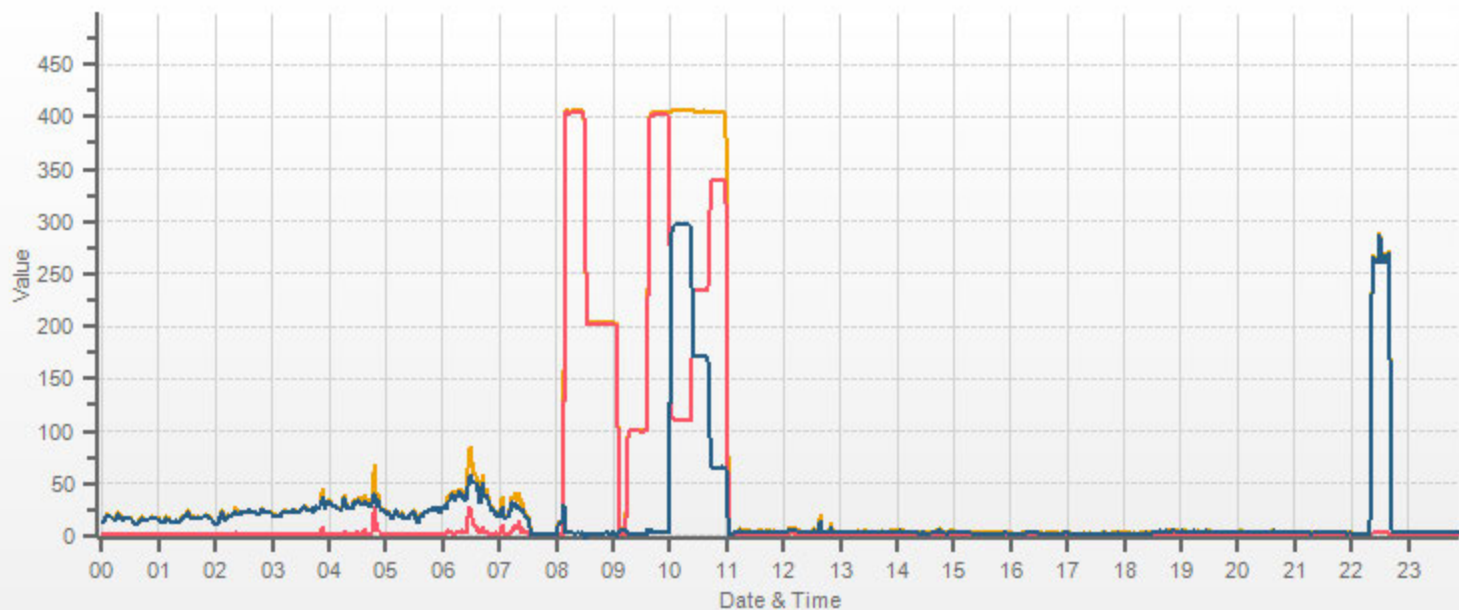
Average Converter Efficiency 100.8%

Remarks:



Station: LICA COLD LAKE SOUTH Daily: 18/03/14 Type: AVG 1 Min. [1 Min.]

NOX[ppb] NO[ppb] NO2[ppb]



O₃ ANALYZER AUDIT

File No. 2017-571A

Date: March 14, 2018 Performed by: Shea Beaton

Station

Name: Cold Lake South Location: Cold Lake
 Facility/Zone: Lica Operator: Maxxam
 Temp. 23.5 Barometric Press. 712mmHg

Monitor

Make/Model: Thermo 49i Serial No: AMU 1748
 Inlet flow (sccm): 713/753 Full Scale Range ppm: 0.5
 Last cal. Date: February 7, 2018 Old Correction Factor: 1.000
 Zero/Bkg -0.1
 Span Coeff. 0.997

Calibrator

Calibration Method: Photometer
 Make/Model: Thermo 49iPS AMU #: 1808
 NO cylinder #: NA NO concentration ppm: NA

Ozone Setting PPB/Current	Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Conc. (ppm)	% Difference	
	Air	Gas	Total			vs Audit Gas	Limits
0	3500	3500	3500	0.0000	0.0001		
400	3500	3500	3500	0.4000	0.3921	-2%	± 10%
200	3500	3500	3500	0.2000	0.1962	-2%	± 10%
100	3500	3500	3500	0.1000	0.0981	-2%	± 10%
Absolute Average Percent Difference						2%	

Linear Regression Analysis:

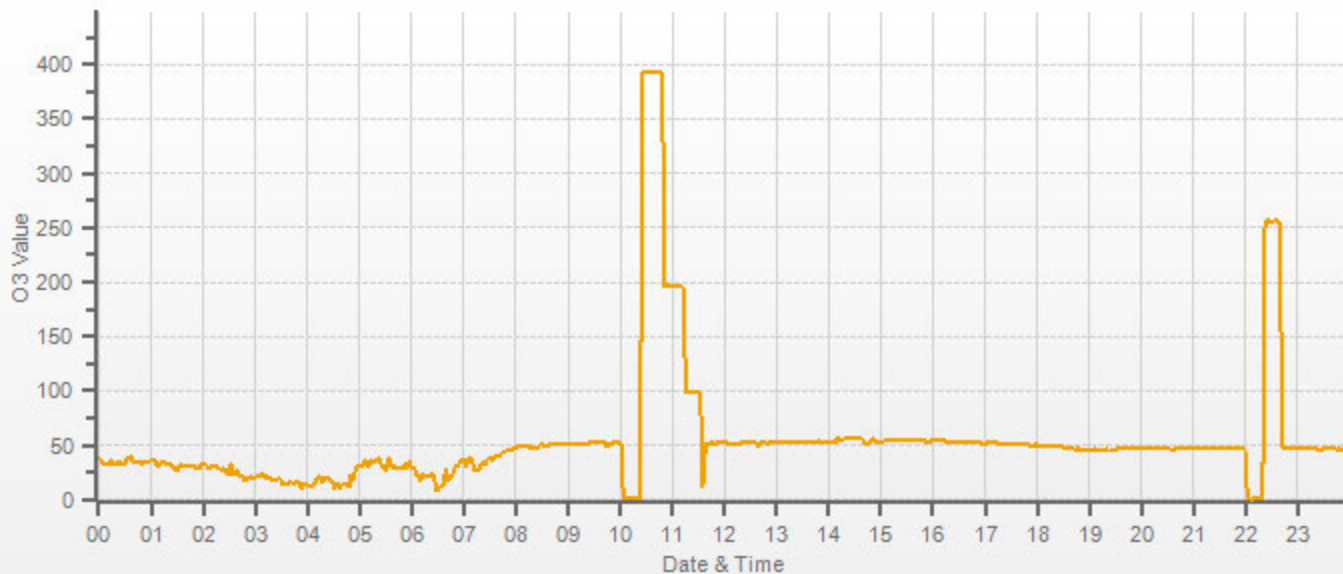
$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

Correlation Coeff.= 1.0000
 m (Slope)= 0.9800
 b (Intercept as % of full scale)= 0.0240

LIMITS
≥ 0.995
0.90-1.10
± 3% F.S.

Remarks:

O3[ppb]



SHARP 5030 ANALYZER AUDIT

File No. 2017-573A

Date: March 14, 2018 Performed by: Shea Beaton

Station

Name: Cold Lake South Location: Cold Lake
Facility/Zone: Lica Operator: Maxxam

Monitor

Make/Model: 5030 Serial No: CM-2209

Flow Audit Transfer Standard

Make/Model BGI Delta Cal Cell s/n 1858
Serial # _____

Met Audit Transfer Standard

Make/Model NA Probe s/n NA
Serial # NA

Sample Flow

Set Pt.(LPH)	<u>1000</u>	Converted to LPM	<u>16.67</u>	Limit(+/-10%)	
Indicated	<u>1000</u>		<u>16.67</u>		<u>0.9%</u>
Conv Meas Flow	<u>1009</u>		<u>16.82</u>	Measured	<u>16.82</u>

Leak Check

Starting value	<u>1009</u>	Lph	Flow	<u>16.82</u>	(LPM)
Leak Check	<u>1007</u>	Lph	Flow	<u>16.78</u>	(LPM)
Adapter			Flow	<u>-0.2%</u>	(LPM+/- 2.5% or 0.42lpm)

Sensors

	Sharp	Audit	Difference	Tolerance
T1 - Amb Tmp°C	<u>5</u>	<u>5.4</u>	<u>0.4</u>	(+/- 4°C)
RH (%RH)	<u>NA</u>	<u>NA</u>	<u>NA</u>	(+/- 2%)
Amb Press(hPa)	<u>946</u>	<u>948.6</u>	<u>0.3%</u>	(+/-13.33hPa)

Background Zero

	Analog	Neph($\mu\text{g}/\text{m}^3$)	Limit	Conc
With Hepa	<u>159</u>	<u>0.1</u>	($\pm 2 \mu\text{g}/\text{m}^3$)	<u>0</u>

Mass Foil Audit (Sensitivity)

	Old Factor	New Factor	Difference	Limit
Span Value	<u>7015</u>	<u>6968</u>	<u>-1%</u>	(+/- 5%)

- RH control set at 58%

Partisol 2000 PM 10/2.5 Audit

File #: 2017-583A

	<u>Station</u>		<u>Audit Transfer Standard</u>
Date:	<u>March 14, 2018</u>	Make/Model:	<u>Delta Cal</u>
Station Name:	<u>Cold Lake South</u>	Serial Number:	<u>AMU 1858</u>
Location:	<u>Cold Lake</u>	Cell s/n:	<u></u>
Operator:	<u>Maxxam</u>		

	<u>Sampler</u>		<u>Instrument Data</u>
Make/Model:	<u>Partisol</u>	Temperature (°C):	<u>9.3</u>
Unit #	<u>2000B206140102</u>	Pressure (ATM)	<u>0.934</u>
Software Ver.	<u></u>	Set Flow (l/min)	<u>16.70</u>

Conversion from mm Hg or "Hg to ATM (Atmospheres)

ATM= (mm Hg) X .001316 or ATM= ("Hg) X .0334207

Note: Tolerances are noted as BOLD in Brackets

Audit

Temperature/Pressure Audit

Measured Temp (± 2°C)	<u>8.6</u>	Δ°C	<u>0.7</u>
Measured Press (± .02 ATM)	<u>0.936</u>	Δ ATM	<u>-0.002</u>

Leak Check

Unit	Flow Controller	Valve	Pump Valve Closed	VL=1/2*V1	Leakage Calculation
Hub	23.0		23.0	11.5	0.00
S1					
S2					
S3					

Flow Audit

(Audit Screen) Indicated Flow (l/min)	<u>16.7</u>	± Difference from Set Flow	<u>0.00</u>
Measured Volumetric Flow (l/min)	<u>16.63</u>	Δ% ± 7%	<u>-0.4%</u>

Other Inspections

	<u>Condition</u>
Rubber Seals in Hub and Satellite	<u>OK</u>
PM Inlet Condition	<u>OK</u>
Large Inline Filter	<u>OK</u>
Air Screens Located Under Rain Hoods	<u>OK</u>

Comments: _____

Auditor/s: Shea Beaton

Station Performance Audit Summary

Company: Lica Facility Name: NA
 Approval No.: NA Site Name: Cold Lake South
 Region: North Saskatchewan District: Cold Lake
 Parameters audited:

H ₂ S		SO ₂	X	NO _x	X	NH ₃		O ₃	X
CO		CH ₄		NonCH ₄		THC	X	TRS	X
PM _{2.5}		PM ₁₀		TSP		BTEX		Wind Speed	X
Wind Dir	X	Amb. Temp	X	Stn.Temp	X	RH	X	Solar Radiation	
Rainfall		Precip		VWS		Other			
All parameters monitored as per approval: Yes _____ No _____ N/A ___X___									

GENERAL

	YES	NO	N/A
Has the location remained unchanged from previous audit?	X		
Is site secure?	X		
Are station operating conditions adequate?	X		

DATA ACQUISITION

Are strip charts in use?	X		
Is a telemetry system for data acquisition in use?	X		

SYSTEM COMPONENTS

Is a glass sampling manifold installed?	X		
Is sampling manifold clean?	X		
Is a manifold trap in place?	X		
Are spare manifold ports capped	X		
Is manifold oriented so it is not exactly horizontal?	X		
Are manifold ports situated to prevent water entering monitors?	X		
Is manifold pump properly installed and operative?	X		
Do sample lines extend at least 3/4" into manifold?	X		
Are monitor sampling lines connected to manifold?	X		
Are sampling lines clean?	X		
Are monitors properly mounted and secure?	X		
Are monitors properly exhausted from room or scrubbed?	X		
Are zero and span systems operational?	X		

WIND EQUIPMENT

Is wind sensor properly oriented?	X		
Does wind equipment appear to be functioning properly?	X		
Date of last calibration.	Date:	November 9, 2017	

COMMENTS:

- Wind Head 8.8m; too short

AUDITOR: Shea Beaton DATE: March 14, 2018



Station Site Documents Audit Checklist

Station	
Name: <u>Cold Lake South</u>	Location: <u>Cold Lake</u>
Facility/Zone: <u>Lica</u>	Operator: <u>Maxxam</u>

Required Elements of AMD Chapter 3 SS 4-B

Do the Site Documents Contain the Following:

- (a) Name of Owner/ Approval Holder
- (b) Name of Operating Agency
- (c) Contact Information
- (d) Date the Site or Station was Established
- (e) Date the information was last updated
- (f) Location including Latitude and Longitude
- (g) Four Colour Photos Looking N, E, S, W From Manifold Inlet
- (h) Additional Photos/Sketches of AMD Standard Site Non-Conformance
- (i) List of Instruments Located at the Site
- (j) Site Description Including the following:
 - (i) Land Use By Sector
 - (ii) Site Elevation
 - (iii) Greatest Angle of Elevation & Direction to Nearby Buildings
 - (iv) Average Building height in the area
 - (v) Distance to Nearest Trees

Meets AMD		NA	Current	
YES	NO		YES	NO
X			X	
X			X	
X			X	
X			X	
X			X	
X			X	
X			X	
		X		
X			X	
X			X	
X			X	
X			X	
X			X	
X			X	

Required Elements of AMD Chapter 3 SS 4-D

Do the Station Site Documents Contain the Following:

- (a) Recent Area Map Covering Approximately 1Km²
- (b) Plan View Sketch
- (c) Cross-Sectional Sketch of Area Within 500 m Radius
- (d) Colour Photos Showing Sample Manifold/Inlet
- (e) Colour Photo of the Station
- (f) Additional Photos/Sketches of AMD Standard Station Non-Conformance

Meets AMD		NA	Current	
YES	NO		YES	NO
X			X	
X			X	
		X		
X			X	
X			X	
		X		

COMMENTS: Met Tower Height incorrect; measured at 8.8m

AUDITOR: Shea Beaton DATE: March 14, 2018



Audit Summary

Form No. F-AA-018

Version 1.2

Page 2 of 3

Facility / Zone	Lica		
Total # of parameters that passed	17		
Total # of parameters audited in the network	17		
Date(s) of the audit	March 13 to 15 2018		
Issue Date of Audit Summary	23-Mar-18		
Station Name	Cold Lake South		
Auditor	Shea Beaton		
Audit Date	14-Mar-18		
Critical	Pass	Fail	
H ₂ S			
SO ₂	X		
TRS	X		
NO / NO ₂ / NO _x	X		
O ₃	X		
THC	X		
Sharp PM _{2.5}	X		
Wind Speed / Wind Direction	X		
Wind head Orientation	X		
Manifold Fan	X		
Partisol PM _{2.5}	X		
Zero/Span Systems Operational	X		
Inspection Items	OK	Need for Improvement	
Sample pump venting/scrubbing	X		
Heating / Air Conditioning	X		
Manifold	X		
Sample Lines	X		
Sharp PM _{2.5}	X		
Partisol PM _{2.5}	X		
Safety	X		
Site Conditions	X		
Non-critical	OK	Opportunity for Improvement	
RH	X		
Station Temperature	X		
Ambient Temperature	X		
Barometric Pressure			
Tipping bucket			
Station Condition	X		
Station Documentation	X		

Not monitored at this location

***APPENDIX IV
MAXIMUM INSTANTANEOUS DATA***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	1	0	0	1	1	1	S	1	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	1	0	24	
2	0	0	1	1	1	S	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24	
3	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	0	1	0	1	0	1	0	1	24	
4	0	0	0	S	0	0	0	1	1	0	0	0	1	1	1	0	0	1	1	1	0	0	1	0	0	0	1	0	24	
5	0	0	S	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	24	
6	1	S	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	24	
7	S	0	0	0	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	2	2	1	1	S	0	2	1	24	
8	0	1	1	0	0	0	0	1	1	1	1	1	1	2	2	2	2	2	2	3	3	2	2	S	1	0	3	1	24	
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	1	1	24	
10	1	1	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	2	1	1	S	1	1	1	1	0	2	1	24	
11	1	1	1	0	1	1	1	1	2	2	2	3	2	2	1	1	2	2	2	S	1	1	1	1	1	0	3	1	24	
12	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	0	1	1	24	
13	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	0	0	1	1	24	
14	1	1	1	1	0	1	1	Q	Q	Q	Q	1	1	1	1	1	1	1	1	1	1	1	1	S	1	0	1	1	24	
15	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	S	1	1	0	1	0	1	24	
16	1	0	0	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	S	0	1	0	0	0	1	1	24	
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	24	
18	1	1	1	0	1	1	0	1	1	0	1	0	1	0	1	0	1	0	S	1	0	1	1	0	0	0	1	1	24	
19	0	0	0	0	1	1	1	0	0	1	C	C	C	C	C	1	1	S	0	0	0	0	1	1	1	0	1	1	24	
20	0	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	S	1	1	0	0	0	1	0	0	0	1	1	24	
21	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	1	0	0	0	0	0	1	0	24
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
24	0	0	0	0	0	0	0	1	1	1	1	1	S	0	0	1	1	1	1	1	1	1	0	1	0	1	0	1	1	24
25	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	0	0	1	1	1	0	0	0	0	0	P	S	2	2	1	1	1	1	1	1	1	1	2	2	2	0	2	1	23	
27	1	1	0	0	0	0	0	0	0	S	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	24
28	0	0	0	0	0	0	0	0	S	0	1	1	0	0	1	0	1	0	0	1	1	0	0	1	0	1	0	1	0	24
29	0	0	0	0	0	0	0	S	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0	24
30	0	0	0	0	0	0	S	0	0	0	1	1	2	1	1	1	2	1	1	1	1	1	1	0	1	0	2	1	24	
31	1	1	1	0	0	S	0	0	0	0	1	1	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	1	0	24
HOURLY MAX	1	1	1	1	1	1	1	1	2	2	2	3	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2
HOURLY AVG	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

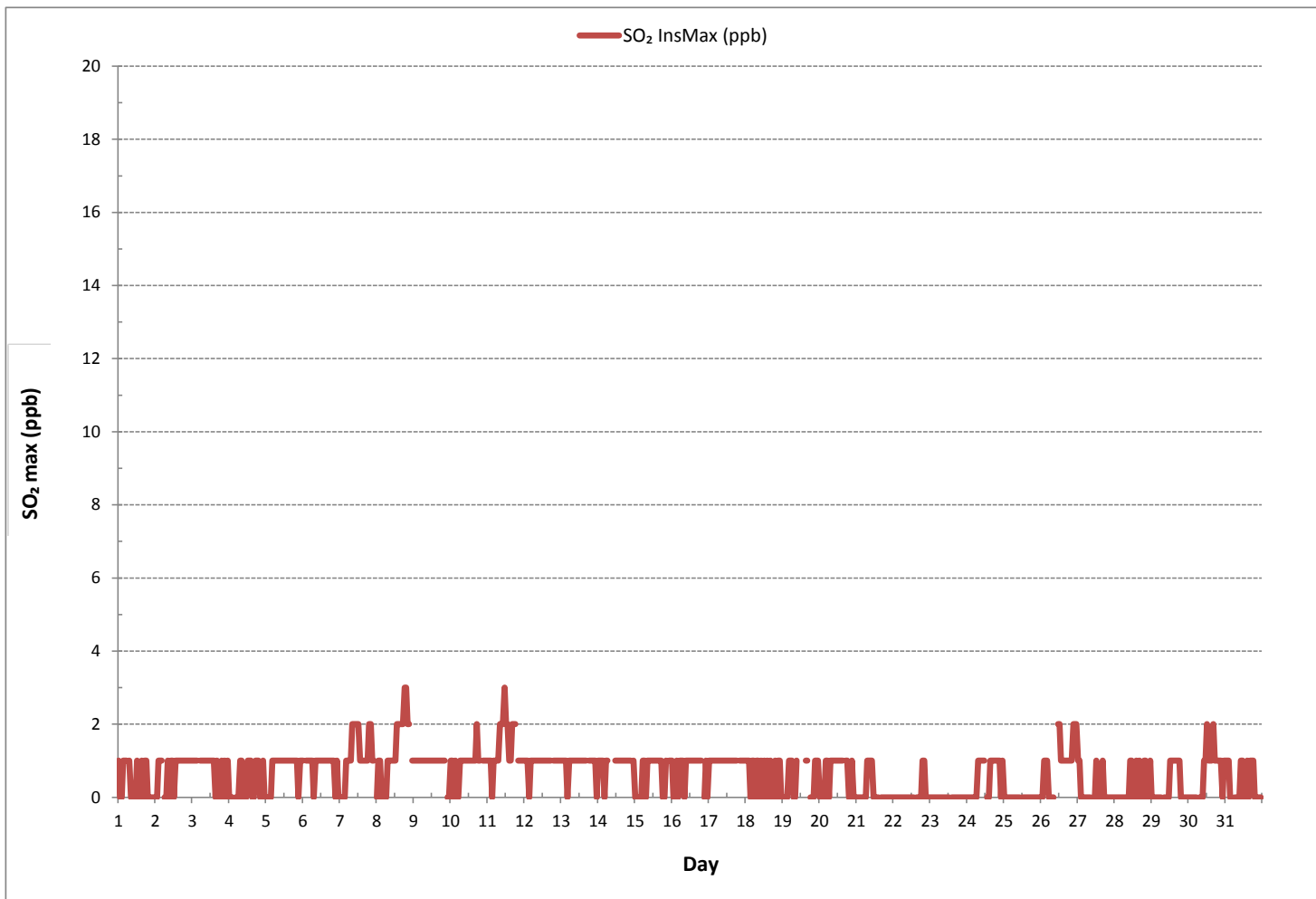
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	420
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 18 ON DAY 8
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	743 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
2	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
3	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
4	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
5	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
6	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
7	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	24
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	24
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	24
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	24
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	24
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	24
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	24
14	1	1	1	1	1	1	1	Q	Q	Q	Q	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	24
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	24
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	24
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	24
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	24
19	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	1	1	S	1	1	1	1	1	1	1	1	24
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	24
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	24
23	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	24
24	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	24
25	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
26	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	23
27	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	24
28	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
29	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
30	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
31	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

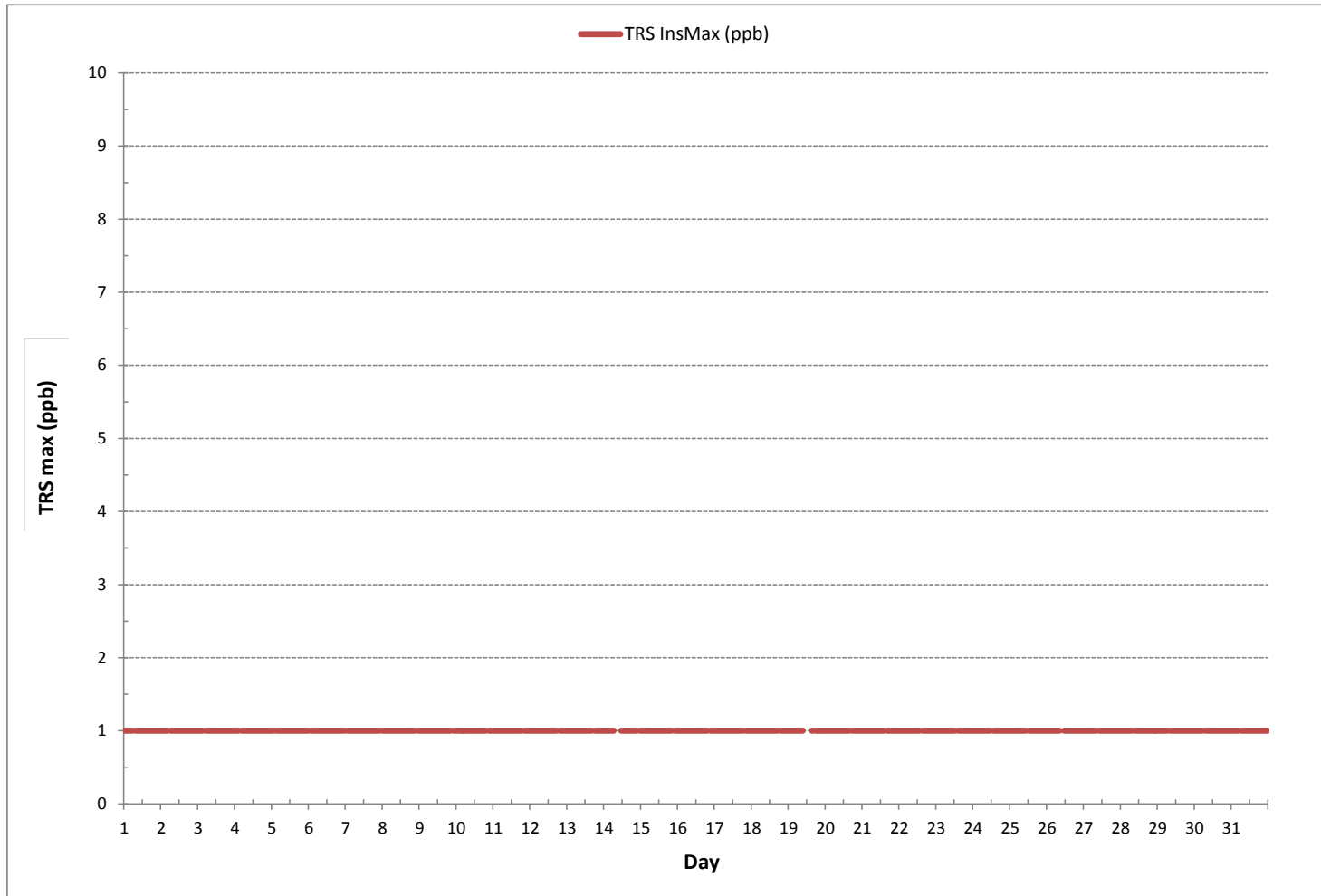
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

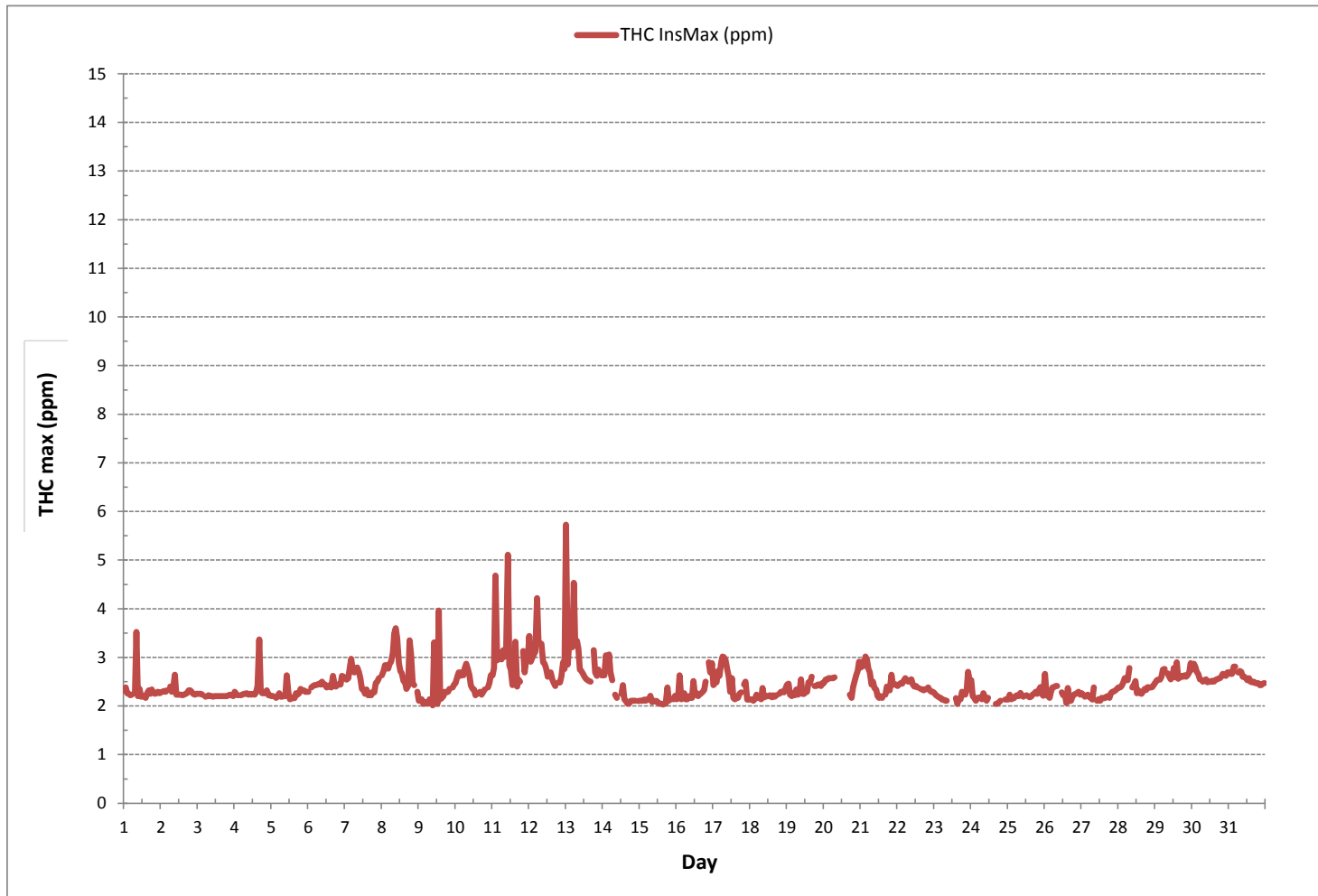
MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	1 ppb @ HOUR 0 ON DAY 1
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	743 hrs
STANDARD DEVIATION:	0

TOTAL REDUCED SULPHUR Instantaneous Maximum (TRS ppb)



TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	19	21	16	11	8	17	S	16	12	4	4	6	3	3	10	5	14	15	16	17	14	12	15	13	3	21	12	24	
2	13	10	3	5	6	S	9	13	14	9	3	8	3	7	9	5	5	8	5	5	5	4	3	3	3	3	14	7	24
3	2	2	3	3	S	3	3	3	3	6	3	3	4	3	3	3	3	4	3	4	7	8	4	3	2	8	4	24	
4	3	3	3	S	3	4	4	3	4	3	4	4	7	7	6	6	5	6	11	10	11	11	5	3	3	11	5	24	
5	2	2	S	3	4	7	4	9	4	2	7	7	7	3	6	18	26	11	5	5	10	9	7	4	2	26	7	24	
6	5	S	6	7	5	5	6	9	13	10	7	6	7	6	5	5	17	6	7	13	11	12	19	8	5	19	8	24	
7	S	17	15	11	8	8	8	18	106	12	11	19	7	4	7	4	6	6	6	7	9	26	11	S	4	106	15	24	
8	19	19	16	18	11	13	20	71	76	67	52	24	15	11	10	18	9	24	41	17	5	6	S	6	5	76	25	24	
9	5	7	5	5	9	13	7	6	10	6	7	6	6	6	7	9	7	8	7	6	7	S	8	8	5	13	7	24	
10	10	23	15	15	25	48	31	35	29	8	10	8	6	5	5	4	8	5	6	9	S	12	10	14	4	48	15	24	
11	9	28	32	38	107	39	32	51	54	28	28	17	16	18	5	4	7	7	12	S	22	21	25	26	4	107	27	24	
12	27	29	41	48	153	69	90	108	52	18	7	9	7	6	8	6	10	4	S	7	7	16	21	3	3	153	32	24	
13	18	24	33	43	38	94	76	100	30	15	15	8	7	13	12	12	12	S	26	26	27	56	26	26	7	100	32	24	
14	21	24	28	47	72	29	87	Q	Q	Q	Q	Q	20	5	6	5	3	3	6	5	7	3	S	4	3	87	21	24	
15	4	5	4	6	6	33	38	11	5	4	4	4	5	8	5	8	8	6	12	9	16	S	8	27	4	38	10	24	
16	10	7	8	14	35	8	21	17	3	3	6	4	3	6	3	3	4	4	11	26	S	13	19	13	3	35	10	24	
17	11	15	10	14	11	16	17	13	11	18	16	9	8	5	3	3	6	4	6	S	7	6	4	2	2	18	9	24	
18	2	4	2	4	4	3	3	4	3	3	6	3	5	3	2	5	3	6	S	6	11	10	14	8	2	14	5	24	
19	11	12	3	5	4	18	18	11	12	6	C	C	C	C	C	C	C	C	4	3	3	3	3	4	3	18	8	24	
20	5	7	6	4	4	4	5	5	5	5	7	7	5	11	5	6	S	5	7	8	20	7	14	18	4	20	7	24	
21	16	18	17	37	42	30	50	12	6	8	6	6	4	6	4	S	4	6	3	6	3	4	4	4	3	50	13	24	
22	5	4	4	3	15	5	8	7	11	4	6	3	4	6	S	8	4	4	4	3	3	2	3	2	2	15	5	24	
23	1	2	2	2	25	8	2	6	3	3	2	6	3	S	4	2	3	3	3	7	4	14	23	26	1	26	7	24	
24	31	4	5	3	127	2	4	3	4	7	7	5	S	6	3	5	4	5	4	3	4	4	2	2	2	2	127	11	24
25	15	9	10	5	5	14	12	8	6	7	2	S	5	2	2	3	3	7	7	18	14	33	11	9	2	33	9	24	
26	14	10	6	2	31	10	3	4	3	P	S	6	6	5	5	16	14	4	3	4	4	3	3	5	2	31	7	23	
27	4	6	6	3	32	11	8	8	4	S	5	4	4	9	8	11	2	2	10	10	8	4	3	2	2	32	7	24	
28	4	4	4	10	11	13	11	12	S	8	4	3	2	2	1	1	1	1	1	4	4	3	5	4	1	13	5	24	
29	2	3	2	3	5	11	16	S	11	10	9	3	6	5	3	3	4	3	3	5	8	14	10	14	2	16	7	24	
30	18	21	17	16	19	25	S	7	2	4	3	5	3	2	2	2	3	3	2	3	5	5	3	3	2	25	8	24	
31	3	3	3	7	7	S	4	4	3	2	2	2	2	2	2	2	2	3	2	2	2	2	3	4	2	7	3	24	
HOURLY MAX	31	29	41	48	153	94	90	108	106	67	52	24	20	18	12	18	26	24	41	26	27	56	26	27					
HOURLY AVG	10	11	11	13	28	19	21	20	17	10	9	7	6	6	5	6	7	6	8	9	9	11	10	9					

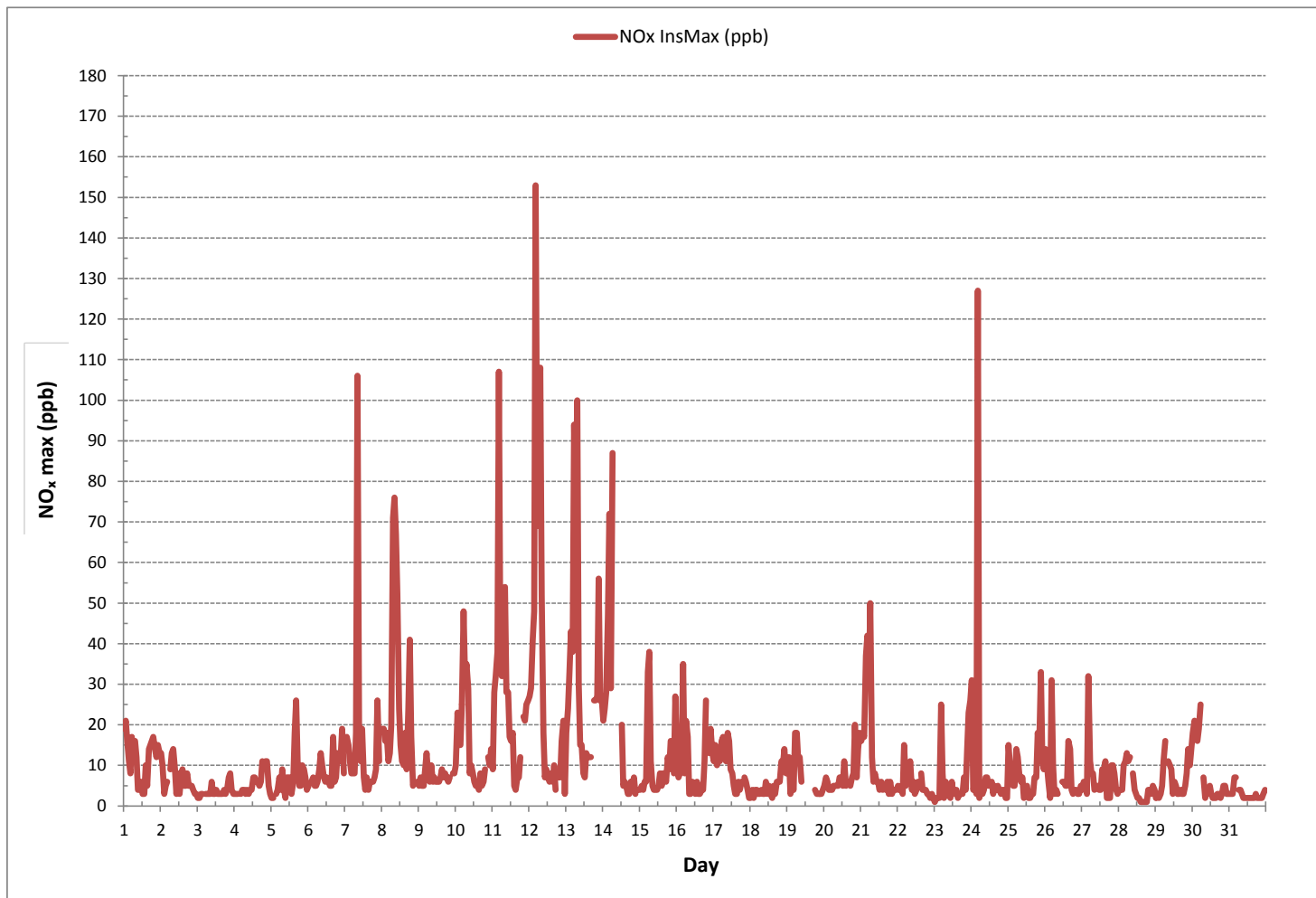
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	699
MAXIMUM INSTANTANEOUS VALUE:	153 ppb @ HOUR 4 ON DAY 12
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	743 hrs
STANDARD DEVIATION:	16

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	3	2	2	2	2	3	S	7	7	2	7	3	2	2	4	1	5	6	5	6	5	4	3	5	1	7	4	24	
2	4	3	1	1	1	S	2	5	7	4	1	2	3	2	5	5	2	2	2	1	2	1	1	1	1	1	7	3	24
3	1	1	1	1	S	1	1	1	2	2	1	1	1	1	1	2	1	1	9	1	5	6	4	1	1	9	2	24	
4	1	1	1	S	1	1	2	1	1	1	1	2	2	1	8	2	3	1	4	4	1	2	1	2	1	8	2	24	
5	1	0	S	1	1	2	1	2	1	1	4	3	3	1	2	9	13	3	1	0	2	1	1	1	0	13	2	24	
6	1	S	1	1	0	1	1	1	3	3	3	3	3	2	3	1	7	2	1	2	2	1	2	0	0	7	2	24	
7	S	2	1	1	1	1	1	6	66	5	4	8	3	3	1	3	3	1	1	0	5	1	S	0	66	5	24		
8	3	1	3	2	1	0	1	40	50	40	28	11	12	4	5	6	2	2	5	1	0	1	S	1	0	50	10	24	
9	1	1	1	1	2	2	1	1	3	2	1	3	2	1	1	3	1	1	1	1	1	S	2	2	1	3	2	24	
10	1	2	3	2	4	19	6	15	16	2	5	3	2	1	1	1	1	0	0	S	2	1	0	0	0	19	4	24	
11	1	2	2	6	74	8	8	24	27	10	13	6	6	2	2	1	2	1	1	S	0	1	0	6	0	74	9	24	
12	5	5	9	19	95	40	54	68	28	5	1	2	1	1	2	1	2	1	S	0	0	2	3	0	0	95	15	24	
13	2	3	4	8	6	63	35	65	11	4	4	2	2	4	10	4	2	S	4	1	1	7	3	1	1	65	11	24	
14	2	1	3	9	27	2	28	Q	Q	Q	Q	Q	5	1	2	2	1	0	1	1	2	1	S	1	0	28	5	24	
15	1	1	1	1	1	7	8	3	1	1	1	2	2	3	4	9	2	2	3	1	3	S	2	6	1	9	3	24	
16	1	1	1	3	12	1	8	9	0	1	2	1	1	2	0	0	1	1	0	3	S	0	2	2	0	12	2	24	
17	0	1	0	1	1	1	1	2	1	4	3	2	3	1	0	1	1	1	1	S	1	1	1	1	0	4	1	24	
18	1	1	1	1	1	1	1	2	1	1	3	1	3	1	1	2	1	1	S	1	1	1	1	4	1	4	1	24	
19	1	1	0	0	2	3	4	3	5	2	C	C	C	C	C	C	C	C	0	0	0	0	0	1	0	5	1	24	
20	0	1	1	0	1	0	0	0	1	1	2	2	1	2	1	1	S	1	0	1	1	0	0	1	0	2	1	24	
21	0	0	1	8	31	4	14	4	2	2	3	2	1	2	1	S	1	1	1	2	15	1	2	1	0	31	4	24	
22	3	2	1	1	7	2	2	2	5	1	3	1	2	2	S	5	1	1	1	1	1	1	1	0	0	7	2	24	
23	0	1	1	0	13	10	1	3	2	1	0	3	1	S	1	1	1	1	5	3	0	1	2	3	0	13	2	24	
24	4	1	1	1	43	0	1	1	1	2	5	1	S	1	1	1	1	1	1	0	1	1	0	0	0	43	3	24	
25	6	2	3	1	1	5	3	3	1	2	1	S	3	1	1	1	0	3	2	6	2	17	1	2	0	17	3	24	
26	3	2	1	0	20	3	0	0	1	P	S	2	3	1	1	13	6	0	1	0	0	0	0	1	0	20	3	23	
27	1	2	2	1	19	3	3	3	1	S	2	1	1	4	5	7	1	1	0	3	2	1	0	0	0	19	3	24	
28	1	0	0	1	2	2	2	3	S	3	2	1	1	1	0	0	0	0	1	1	1	1	3	2	0	3	1	24	
29	1	1	1	1	7	3	12	S	4	6	6	1	2	3	1	1	2	1	1	1	1	2	1	1	1	12	3	24	
30	1	2	1	4	3	6	S	2	1	2	1	3	1	1	1	1	1	1	0	0	1	1	1	0	0	6	2	24	
31	0	1	1	1	1	S	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	1	0	0	1	1	24	
HOURLY MAX	6	5	9	19	95	63	54	68	66	40	28	11	12	4	10	13	13	6	9	6	15	17	4	6					
HOURLY AVG	2	1	2	3	13	7	7	10	9	4	4	3	3	2	2	3	2	1	2	1	2	2	1	2					

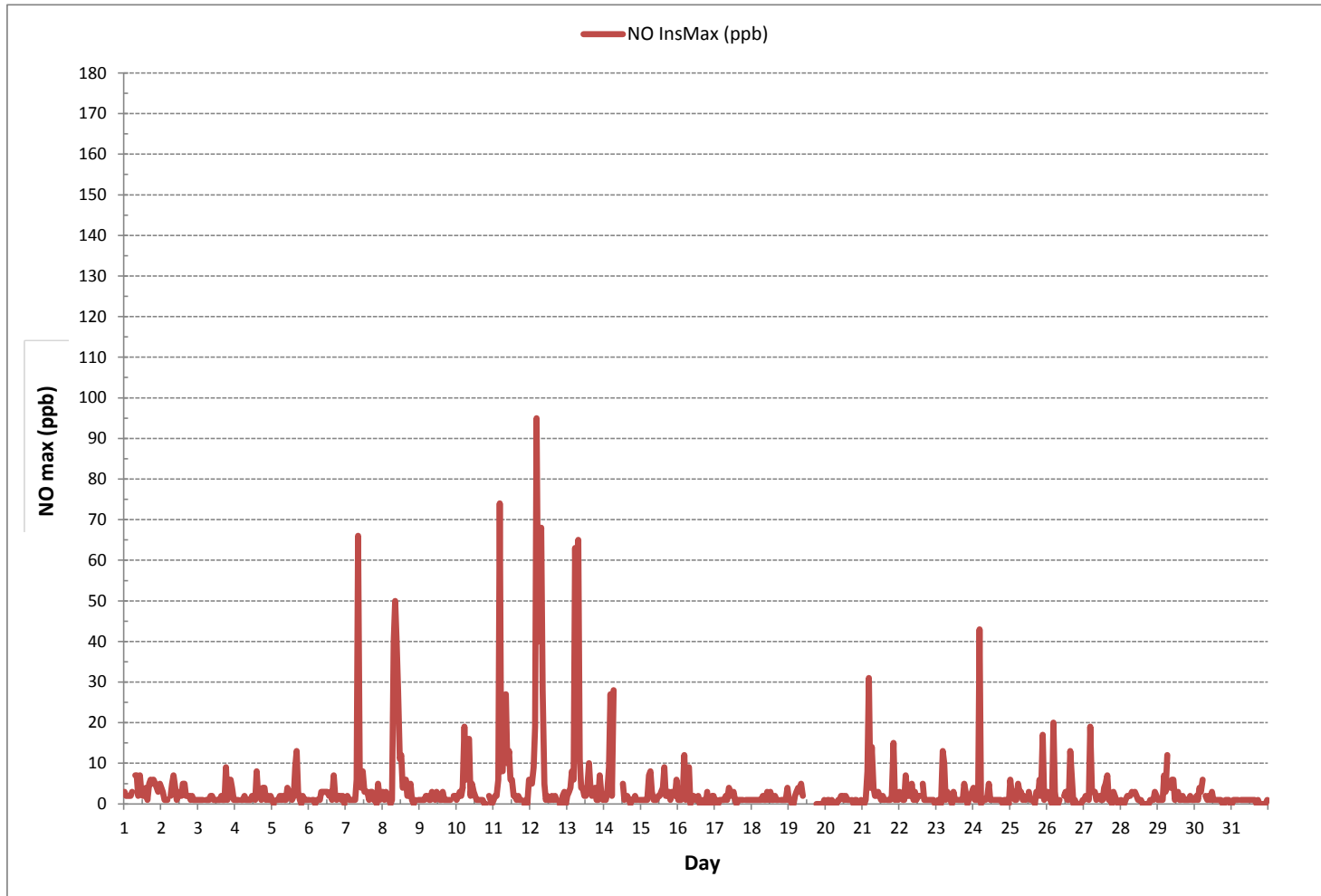
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	620
MAXIMUM INSTANTANEOUS VALUE:	95 ppb @ HOUR 4 ON DAY 12
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	8
OPERATIONAL TIME:	743 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	17	19	15	10	7	15	S	11	8	3	2	4	1	2	6	4	10	12	12	13	9	10	12	8	1	19	9	24	
2	9	8	3	4	5	S	8	8	8	6	2	6	2	6	6	4	3	7	3	4	3	2	2	2	2	2	9	5	24
3	2	2	2	2	S	2	2	2	3	4	2	2	2	2	2	2	2	3	2	3	4	3	3	2	2	4	2	24	
4	2	2	2	S	3	3	3	2	3	3	3	2	6	5	3	4	4	5	8	9	10	10	3	3	2	10	4	24	
5	1	1	S	2	2	4	3	7	3	1	6	4	4	2	4	10	13	9	4	5	9	8	7	4	1	13	5	24	
6	4	S	6	6	4	5	6	8	10	7	4	4	4	4	3	4	12	4	6	11	10	11	17	8	3	17	7	24	
7	S	16	15	10	7	7	8	14	41	7	6	11	4	3	5	3	3	4	5	7	8	22	11	S	3	41	10	24	
8	16	18	14	17	10	12	19	32	29	29	25	13	10	7	7	11	8	22	38	17	5	6	S	5	5	38	16	24	
9	4	6	5	5	7	11	6	6	7	5	6	4	4	5	6	7	6	8	6	6	6	S	7	7	4	11	6	24	
10	10	22	13	14	21	28	26	22	15	6	5	5	4	4	4	3	7	5	6	9	S	12	9	14	3	28	11	24	
11	9	28	29	32	40	31	24	27	27	18	17	11	10	16	4	3	5	6	12	S	21	21	24	23	3	40	19	24	
12	26	28	32	29	59	33	38	42	25	13	5	7	5	4	6	5	8	3	S	7	7	14	18	3	3	59	18	24	
13	15	21	30	35	32	37	42	39	19	11	11	6	5	9	7	9	9	S	26	26	26	49	24	25	5	49	22	24	
14	20	23	25	38	46	28	60	Q	Q	Q	Q	Q	15	4	5	3	3	2	5	4	6	2	S	3	2	60	16	24	
15	4	4	3	5	5	26	30	9	4	3	2	2	4	5	3	3	6	5	9	8	14	S	7	21	2	30	8	24	
16	9	6	6	11	27	8	19	8	2	2	5	3	2	4	2	3	3	4	10	23	S	13	17	12	2	27	9	24	
17	10	14	10	13	11	15	16	13	10	15	13	7	5	4	2	3	5	4	5	S	6	6	3	2	2	16	8	24	
18	2	3	2	3	3	2	2	2	2	2	4	2	3	2	2	4	2	5	S	5	10	10	13	7	2	13	4	24	
19	11	12	2	5	3	15	15	9	7	5	C	C	C	C	C	C	C	C	C	4	3	3	3	3	3	2	15	6	24
20	4	6	6	4	4	4	5	5	4	4	5	5	4	8	4	5	S	4	7	8	19	6	14	17	4	19	7	24	
21	15	18	17	29	28	25	36	9	5	6	5	4	3	4	3	S	3	5	3	4	2	3	3	3	2	36	10	24	
22	2	2	3	2	8	3	6	5	8	3	4	2	3	5	S	3	3	3	4	3	3	2	2	1	1	8	3	24	
23	1	2	1	1	19	3	2	4	2	2	1	4	2	S	3	2	2	3	2	5	3	13	21	24	1	24	5	24	
24	27	4	4	2	93	2	4	2	3	5	3	3	S	5	2	4	3	4	4	3	4	3	1	2	1	93	8	24	
25	10	7	7	4	5	10	9	6	5	6	1	S	3	1	1	2	3	5	7	12	13	17	10	8	1	17	7	24	
26	12	8	5	1	15	7	3	3	2	P	S	4	4	4	4	8	9	4	2	4	4	3	2	5	1	15	5	23	
27	4	4	4	2	17	8	6	5	3	S	3	3	2	5	3	5	2	1	2	7	9	7	4	3	1	17	5	24	
28	4	4	4	9	10	12	10	10	S	5	3	2	1	1	1	1	1	1	1	3	3	3	3	2	1	12	4	24	
29	1	2	1	2	3	8	10	S	6	5	4	2	6	3	2	2	2	2	2	5	8	13	9	13	1	13	5	24	
30	17	20	17	14	17	18	S	6	1	1	2	2	1	1	1	1	2	2	2	2	5	4	2	2	1	20	6	24	
31	2	3	3	7	6	S	4	3	2	1	1	1	1	1	1	1	1	2	1	2	2	2	2	3	1	7	2	24	
HOURLY MAX	27	28	32	38	93	37	60	42	41	29	25	13	15	16	7	11	13	22	38	26	26	49	24	25					
HOURLY AVG	9	10	10	11	17	13	15	11	9	6	5	4	4	4	4	4	5	5	7	8	8	10	9	8					

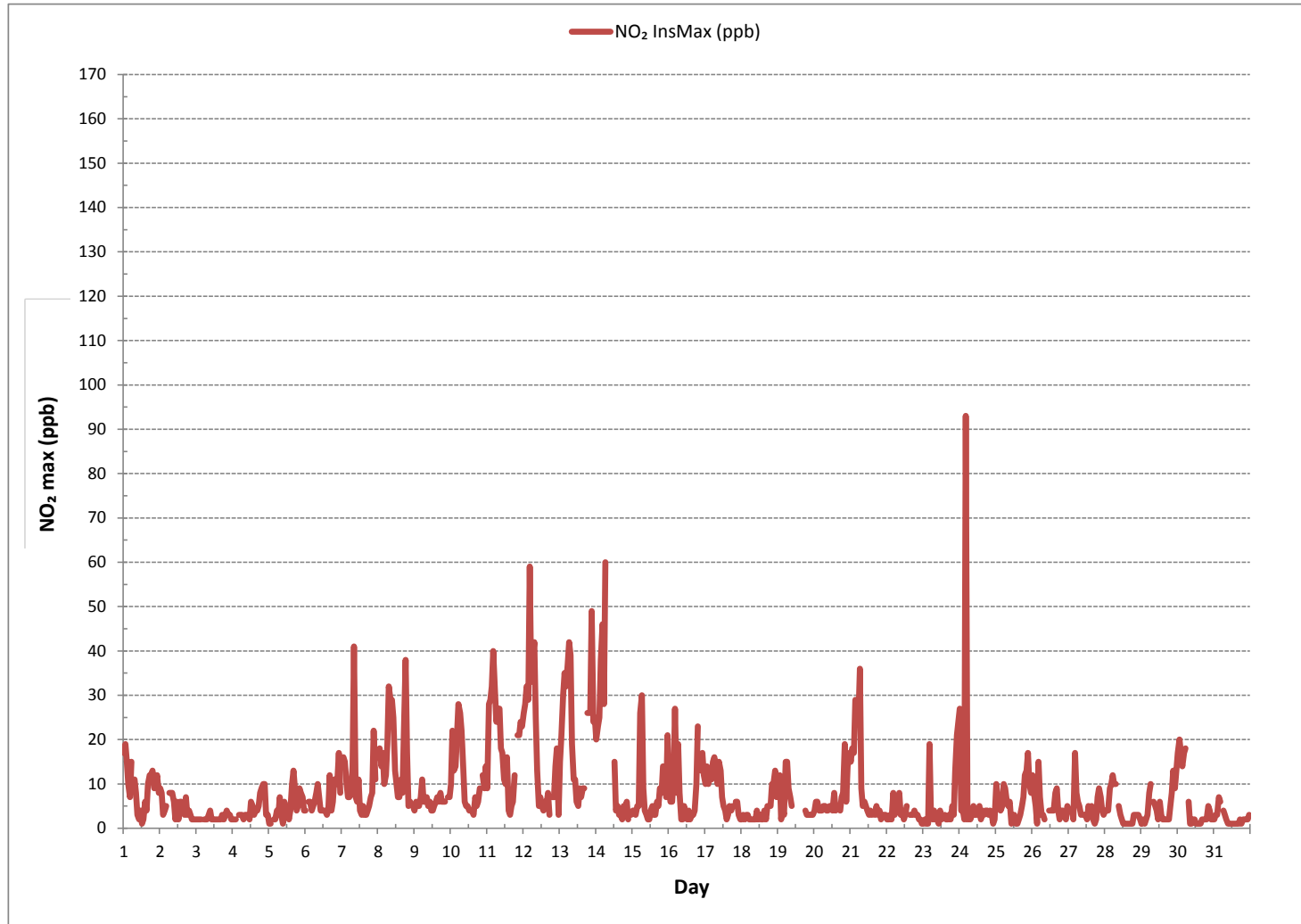
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	699
MAXIMUM INSTANTANEOUS VALUE:	93 ppb @ HOUR 4 ON DAY 24
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
STANDARD DEVIATION:	9
OPERATIONAL TIME:	743 hrs

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

OZONE Instantaneous Maximum (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	28.9	28.9	33.8	36.5	36.4	35.9	S	35.4	36.7	37.4	38.2	39.5	40.0	40.7	40.8	41.0	39.9	39.3	39.9	38.4	37.4	38.1	38.0	37.3	28.9	41.0	37.3	24
2	36.2	35.7	36.1	35.4	35.1	S	33.8	33.9	33.9	36.7	37.0	37.7	38.5	38.7	38.4	37.5	37.4	37.3	36.5	35.9	36.5	36.5	35.6	35.4	33.8	38.7	36.3	24
3	35.7	36.1	36.5	37.5	S	39.0	38.8	38.4	38.0	37.5	37.5	38.4	38.7	39.6	39.3	39.8	39.9	39.6	39.0	39.0	37.7	37.2	37.3	37.4	35.7	39.9	38.2	24
4	37.5	37.3	36.8	S	37.1	36.4	36.1	35.7	35.6	35.4	35.4	35.7	35.6	34.5	34.7	35.0	35.7	35.3	33.9	33.3	32.3	32.2	33.5	33.3	32.2	37.5	35.1	24
5	33.8	33.5	S	34.1	34.2	34.2	34.8	33.8	33.9	34.4	35.0	35.0	34.8	34.7	34.7	33.3	32.6	34.4	34.1	32.0	31.0	31.9	35.9	35.9	31.0	35.9	34.0	24
6	35.9	S	34.8	34.4	34.7	32.0	31.7	29.9	28.5	31.3	32.6	33.5	34.7	35.7	35.9	37.6	38.0	37.1	37.0	34.1	34.7	31.0	27.7	28.2	27.7	38.0	33.5	24
7	S	22.1	22.1	22.1	23.8	27.6	26.7	23.2	29.4	30.2	32.6	35.7	38.8	40.5	41.4	41.1	41.8	41.8	40.7	39.6	37.7	34.2	29.7	S	22.1	41.8	32.9	24
8	26.1	23.0	19.6	23.0	20.8	18.7	15.5	11.8	13.5	29.7	32.3	35.3	38.9	44.6	45.2	45.8	45.7	43.6	36.1	48.0	47.4	47.6	S	47.8	11.8	48.0	33.0	24
9	47.7	46.6	46.6	46.3	46.0	45.7	45.2	44.5	44.0	44.6	44.8	40.7	43.3	44.6	43.3	43.6	43.0	40.8	41.1	41.2	41.3	S	38.8	38.1	38.1	47.7	43.6	24
10	34.4	29.4	26.7	22.7	22.1	19.6	19.2	15.6	37.3	41.4	41.8	42.2	45.1	47.5	48.9	50.3	50.1	49.1	47.5	45.7	S	40.5	40.5	38.7	15.6	50.3	37.2	24
11	35.6	29.1	28.0	11.6	8.4	14.3	13.1	8.7	26.5	31.4	38.4	42.1	45.1	48.7	51.3	53.3	53.6	52.8	49.8	S	39.5	39.9	32.9	28.3	8.4	53.6	34.0	24
12	28.3	13.7	9.8	6.9	2.5	2.8	2.5	13.7	41.5	47.7	48.7	52.8	54.2	55.7	55.7	54.5	53.7	52.5	S	51.9	52.5	46.9	42.8	39.9	2.5	55.7	36.1	24
13	40.0	24.7	19.9	13.8	11.5	11.8	2.5	26.2	46.0	47.4	50.8	52.4	55.9	56.7	57.4	59.2	60.2	S	50.1	41.5	41.0	36.4	43.5	45.2	2.5	60.2	38.9	24
14	39.4	38.0	33.5	23.3	31.0	38.8	38.2	P	51.5	52.2	Q	Q	53.1	53.3	56.7	54.7	54.5	52.1	49.7	47.2	47.4	47.5	S	47.2	23.3	56.7	45.5	23
15	46.1	45.7	44.9	44.1	43.6	42.4	40.2	41.4	43.4	44.6	45.1	45.8	47.2	47.6	47.4	47.2	47.1	46.6	44.2	44.9	44.1	S	44.0	41.2	40.2	47.6	44.7	24
16	42.5	43.1	42.2	42.1	40.8	40.6	39.9	41.8	42.3	42.5	42.8	43.0	43.9	44.8	45.5	45.7	45.8	45.2	43.6	37.2	S	31.5	25.5	27.4	25.5	45.8	40.9	24
17	29.8	31.6	31.6	30.4	31.6	30.3	25.3	27.6	29.9	34.1	42.2	49.4	49.8	50.1	50.4	57.2	50.3	49.8	49.4	S	47.8	45.8	44.4	43.3	25.3	57.2	40.5	24
18	42.1	41.3	40.5	39.6	38.5	38.2	39.1	40.1	40.2	40.4	40.3	40.3	40.0	40.2	40.1	39.8	39.4	38.4	S	36.5	33.9	33.9	33.0	31.4	31.4	42.1	38.6	24
19	27.6	32.0	35.0	34.8	34.5	33.9	33.0	33.0	33.8	35.0	35.3	36.5	37.4	40.2	50.4	52.2	51.8	S	47.4	48.4	48.9	48.7	47.7	46.3	27.6	52.2	40.2	24
20	43.3	41.9	42.4	45.4	46.3	47.8	46.1	44.5	C	C	C	C	C	C	55.6	56.8	S	55.3	51.9	44.8	42.9	50.3	44.5	41.5	41.5	56.8	47.1	24
21	39.8	32.0	23.2	25.2	27.1	33.2	39.3	41.1	43.2	43.3	43.5	41.7	39.9	39.6	39.1	S	40.1	40.3	40.2	40.5	40.3	40.0	40.6	40.0	23.2	43.5	38.0	24
22	39.8	39.4	37.7	35.4	35.0	36.2	37.0	36.7	37.1	37.5	39.1	40.9	42.2	40.8	S	39.9	40.9	50.9	52.4	53.4	52.8	51.9	50.8	49.8	35.0	53.4	42.5	24
23	49.6	49.5	49.5	49.2	48.7	48.0	46.9	46.2	45.8	44.9	44.5	43.9	43.4	S	43.0	43.0	43.3	42.9	42.4	42.2	40.9	40.2	23.1	11.6	11.6	49.6	42.7	24
24	41.4	42.2	44.2	44.7	44.7	44.4	43.4	42.7	42.8	44.2	47.5	47.5	S	47.8	45.5	45.2	41.8	39.6	38.9	40.2	39.3	38.0	38.2	38.2	38.0	47.8	42.7	24
25	37.7	35.5	35.3	34.3	33.1	33.3	32.2	34.2	35.9	36.5	37.4	S	38.5	39.8	40.0	40.0	40.1	40.0	39.4	38.0	33.4	33.6	34.3	35.1	32.2	40.1	36.4	24
26	30.9	37.9	37.1	39.0	38.7	38.4	43.4	44.0	44.0	P	S	46.1	46.1	47.7	48.4	48.4	48.9	44.5	35.6	33.3	34.3	34.2	33.3	33.8	30.9	48.9	40.4	23
27	33.3	33.4	35.4	36.5	36.4	36.2	35.2	35.7	43.5	S	37.4	38.8	36.8	36.6	36.2	36.6	36.8	36.8	36.8	36.9	36.2	33.1	32.2	29.2	29.2	43.5	35.9	24
28	26.1	23.9	21.8	20.6	18.7	16.3	26.2	28.6	S	33.9	34.9	37.5	39.3	41.8	41.9	43.7	44.3	44.8	44.3	44.5	43.0	43.4	42.7	42.6	16.3	44.8	35.0	24
29	41.8	40.9	40.6	39.7	39.1	36.9	33.9	S	39.1	40.8	40.8	40.2	41.2	40.8	41.3	41.6	41.4	41.2	41.1	39.6	36.8	33.2	32.4	26.2	26.2	41.8	38.7	24
30	20.6	18.8	19.8	19.9	25.3	28.6	S	35.0	35.9	37.1	38.3	39.4	39.4	38.8	38.3	38.5	39.3	39.3	39.6	39.1	37.9	37.1	38.0	38.0	18.8	39.6	34.0	24
31	38.4	38.7	38.8	38.3	35.7	S	38.4	38.1	38.7	39.4	41.7	42.1	43.3	45.1	45.5	46.2	46.4	46.1	45.4	45.9	46.0	46.1	46.1	45.4	35.7	46.4	42.4	24
HOURLY MAX	49.6	49.5	49.5	49.2	48.7	48.0	46.9	46.2	51.5	52.2	50.8	52.8	55.9	56.7	57.4	59.2	60.2	55.3	52.4	53.4	52.8	51.9	50.8	49.8				
HOURLY AVG	36.3	34.2	33.5	32.2	32.0	32.5	32.3	33.2	37.7	39.0	39.9	41.2	42.2	43.4	44.4	45.0	44.1	43.4	42.3	41.1	40.5	39.3	37.5	37.1				

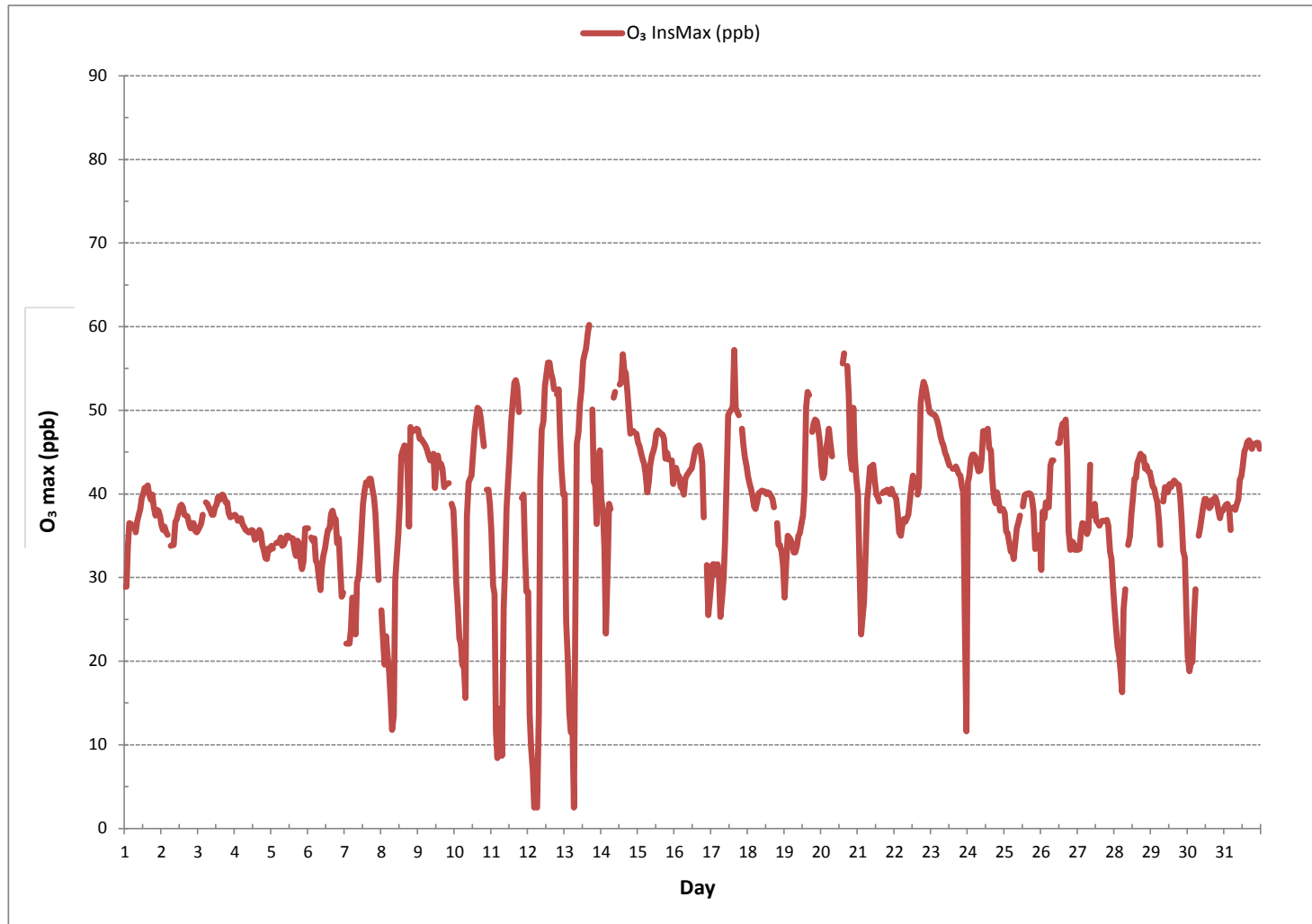
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	60.2 ppb @ HOUR 16 ON DAY 13
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	742 hrs
STANDARD DEVIATION:	8.8

OZONE Instantaneous Maximum (O₃ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Cold Lake South Continuous Monitoring Station - March 2018

WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	4.7	3.6	3.9	4.9	5.6	3.9	8.1	9.3	12.2	12.2	14.9	12.1	9.4	8.4	8.4	9.7	6.7	9.4	13.1	8.9	8.7	7.8	9.2	8.8	3.6	14.9	8.5	24				
2	5.7	6.2	7.0	7.4	7.8	7.0	8.2	11.8	12.8	20.1	22.5	21.0	16.9	17.6	18.3	20.7	17.7	19.7	15.4	17.0	14.8	19.7	17.2	20.0	5.7	22.5	14.7	24				
3	19.1	18.4	19.2	22.2	21.8	22.6	27.6	23.5	21.5	19.9	23.6	24.0	23.9	21.4	20.6	21.6	22.4	21.1	17.5	19.6	16.9	15.8	16.7	18.7	15.8	27.6	20.8	24				
4	17.2	19.4	18.1	15.5	12.1	11.3	10.4	9.8	12.3	10.0	9.8	13.1	12.5	14.3	12.4	11.2	7.9	7.3	5.5	5.3	3.9	8.1	11.4	9.9	3.9	19.4	11.2	24				
5	11.8	12.4	11.1	11.2	9.6	9.6	10.8	7.6	10.3	11.0	10.5	8.9	7.1	5.8	3.8	6.1	3.5	8.9	6.1	3.6	5.1	6.7	11.1	6.8	3.5	12.4	8.3	24				
6	8.8	9.8	12.4	11.1	13.3	10.8	13.3	12.7	11.4	12.0	14.0	16.0	16.3	17.5	16.7	14.7	14.1	13.1	7.5	6.2	7.5	4.3	16.1	2.8	2.8	17.5	11.8	24				
7	9.1	7.6	4.9	4.0	5.3	6.9	3.6	2.2	7.6	7.8	7.2	9.1	10.6	12.2	13.1	11.0	9.5	6.6	5.9	5.6	8.4	6.2	3.2	3.8	2.2	13.1	7.1	24				
8	3.4	3.1	3.7	3.5	4.2	3.7	5.2	6.0	4.3	5.0	5.8	6.2	7.1	7.2	6.2	6.1	5.6	4.3	5.6	12.5	10.1	9.1	12.1	11.4	3.1	12.5	6.3	24				
9	10.5	11.5	10.5	10.3	9.2	11.0	9.3	10.4	7.7	8.5	7.3	7.2	7.0	7.3	8.3	9.4	10.7	10.0	9.1	8.2	8.7	8.1	8.9	7.1	7.0	11.5	9.0	24				
10	6.1	2.6	3.3	4.8	3.1	3.6	2.6	2.6	4.9	11.1	12.5	12.7	14.5	13.2	14.5	13.9	13.6	10.6	7.5	6.1	5.0	6.1	7.0	6.1	2.6	14.5	7.8	24				
11	4.9	2.3	1.5	3.4	2.1	4.1	1.9	2.0	4.3	4.1	6.3	7.5	7.8	5.6	7.8	8.3	9.3	6.2	3.1	1.8	2.3	1.6	2.9	2.9	1.5	9.3	4.3	24				
12	2.4	3.9	2.3	2.1	1.8	3.3	2.8	3.5	5.0	6.1	5.9	9.1	11.0	11.0	10.9	11.3	10.2	6.1	4.3	5.9	5.6	2.1	1.3	1.2	1.2	11.3	5.4	24				
13	3.5	2.3	3.1	3.1	2.6	1.9	3.6	4.6	5.6	6.7	6.0	7.3	5.6	6.7	9.5	11.1	7.7	4.6	4.0	4.0	4.2	2.3	2.9	3.7	1.9	11.1	4.9	24				
14	6.6	3.6	3.0	2.6	5.1	3.9	5.8	P	10.2	10.9	14.3	12.8	12.9	13.4	23.4	24.0	21.4	25.4	17.5	17.5	16.1	17.0	13.1	12.8	2.6	25.4	12.8	23				
15	10.3	13.0	14.8	10.1	10.5	9.1	8.3	8.9	10.5	11.9	14.4	14.9	12.4	13.6	13.5	15.2	12.7	11.2	9.0	8.3	8.2	6.1	7.6	4.6	4.6	15.2	10.8	24				
16	7.4	10.8	9.0	7.1	5.5	6.7	5.4	7.9	7.9	6.5	7.6	8.4	7.3	5.6	7.2	6.1	6.4	6.6	2.4	2.2	3.9	1.4	4.8	4.9	1.4	10.8	6.2	24				
17	3.5	3.5	4.2	5.0	5.3	2.9	3.4	3.0	2.9	5.7	5.4	8.5	8.3	7.0	7.8	4.6	7.4	7.5	5.9	5.8	5.1	12.8	15.3	15.7	2.9	15.7	6.5	24				
18	12.4	13.0	14.0	11.6	11.1	13.6	13.6	15.3	14.5	14.8	11.9	11.0	9.0	10.8	8.4	7.7	8.1	6.1	6.0	7.1	4.9	4.4	4.7	3.1	3.1	15.3	9.9	24				
19	2.4	4.2	9.3	7.9	11.1	6.9	6.5	5.4	5.8	7.3	7.0	10.8	9.3	9.3	12.6	14.0	14.0	12.0	6.4	7.9	9.1	7.4	5.0	3.1	2.4	14.0	8.1	24				
20	3.9	2.4	5.4	7.4	8.2	7.8	5.7	7.0	7.2	8.7	11.3	11.3	11.5	13.0	10.7	10.4	10.0	8.2	5.2	3.6	4.1	7.2	2.9	3.4	2.4	13.0	7.4	24				
21	3.2	2.9	4.7	2.9	5.0	3.6	8.0	9.7	11.1	12.8	12.9	13.0	15.4	15.0	16.9	17.0	17.4	17.0	17.2	19.6	18.2	16.3	14.2	13.1	2.9	19.6	12.0	24				
22	12.4	14.0	11.6	11.4	13.2	13.8	12.8	13.6	14.4	15.5	19.5	17.2	19.0	19.1	21.1	23.9	19.2	18.3	21.7	23.4	23.6	18.8	19.2	25.4	11.4	25.4	17.6	24				
23	21.6	21.3	23.2	21.6	23.2	20.5	19.9	18.3	23.7	25.0	21.0	20.1	22.4	20.7	21.3	19.8	15.5	8.4	6.8	7.4	7.2	5.5	3.9	4.8	3.9	25.0	16.8	24				
24	9.9	10.7	10.4	15.0	13.9	9.0	5.4	7.9	11.3	12.7	13.2	12.6	10.8	18.1	16.2	13.5	14.2	11.3	14.0	12.0	10.7	7.7	8.5	10.6	5.4	18.1	11.7	24				
25	9.7	6.0	7.8	9.3	5.4	5.3	5.8	7.9	8.8	7.7	8.0	7.7	8.7	9.3	10.1	11.4	8.4	7.6	7.3	6.8	4.2	3.2	5.3	4.3	3.2	11.4	7.3	24				
26	5.3	5.4	9.8	13.6	7.2	8.7	7.8	11.9	12.3	P	13.7	15.4	15.7	15.3	13.6	11.6	19.0	21.3	19.4	18.7	19.5	16.8	16.0	13.3	5.3	21.3	13.5	23				
27	9.7	9.8	10.4	13.5	11.9	10.9	17.7	17.6	17.6	20.6	20.8	18.4	17.6	14.7	10.4	9.9	10.4	11.2	10.2	9.6	5.3	3.0	3.0	2.9	2.9	20.8	12.0	24				
28	12.6	3.0	2.7	1.4	4.5	6.0	8.2	9.1	11.0	14.4	14.6	19.2	21.2	20.8	19.6	17.3	18.9	17.8	17.0	16.9	17.5	18.1	18.0	17.4	1.4	21.2	13.6	24				
29	16.4	11.3	13.2	17.3	11.1	5.9	7.4	11.7	9.3	10.3	13.0	13.2	10.0	13.0	9.2	10.5	12.3	11.2	7.5	2.9	2.7	5.2	3.1	2.5	2.5	17.3	9.6	24				
30	2.6	3.0	3.3	4.9	5.0	5.4	6.0	15.5	15.6	15.6	14.5	13.2	22.5	20.2	24.4	26.6	24.1	24.1	20.8	16.7	14.1	7.3	10.4	9.4	2.6	26.6	13.6	24				
31	11.2	12.5	7.9	8.9	10.0	10.2	14.2	14.9	17.3	13.8	15.4	20.9	22.3	23.9	24.4	25.7	26.6	21.3	20.8	20.1	17.3	13.4	10.8	11.1	7.9	26.6	16.5	24				
HOURLY MAX	21.6	21.3	23.2	22.2	23.2	22.6	27.6	23.5	23.7	25.0	23.6	24.0	23.9	23.9	24.4	26.6	26.6	25.4	21.7	23.4	23.6	19.7	19.2	25.4								
HOURLY AVG	8.7	8.2	8.6	8.9	8.6	8.1	8.7	9.7	10.7	11.6	12.4	13.0	13.1	13.3	13.6	13.7	13.1	12.1	10.3	10.0	9.4	8.7	9.2	8.6								

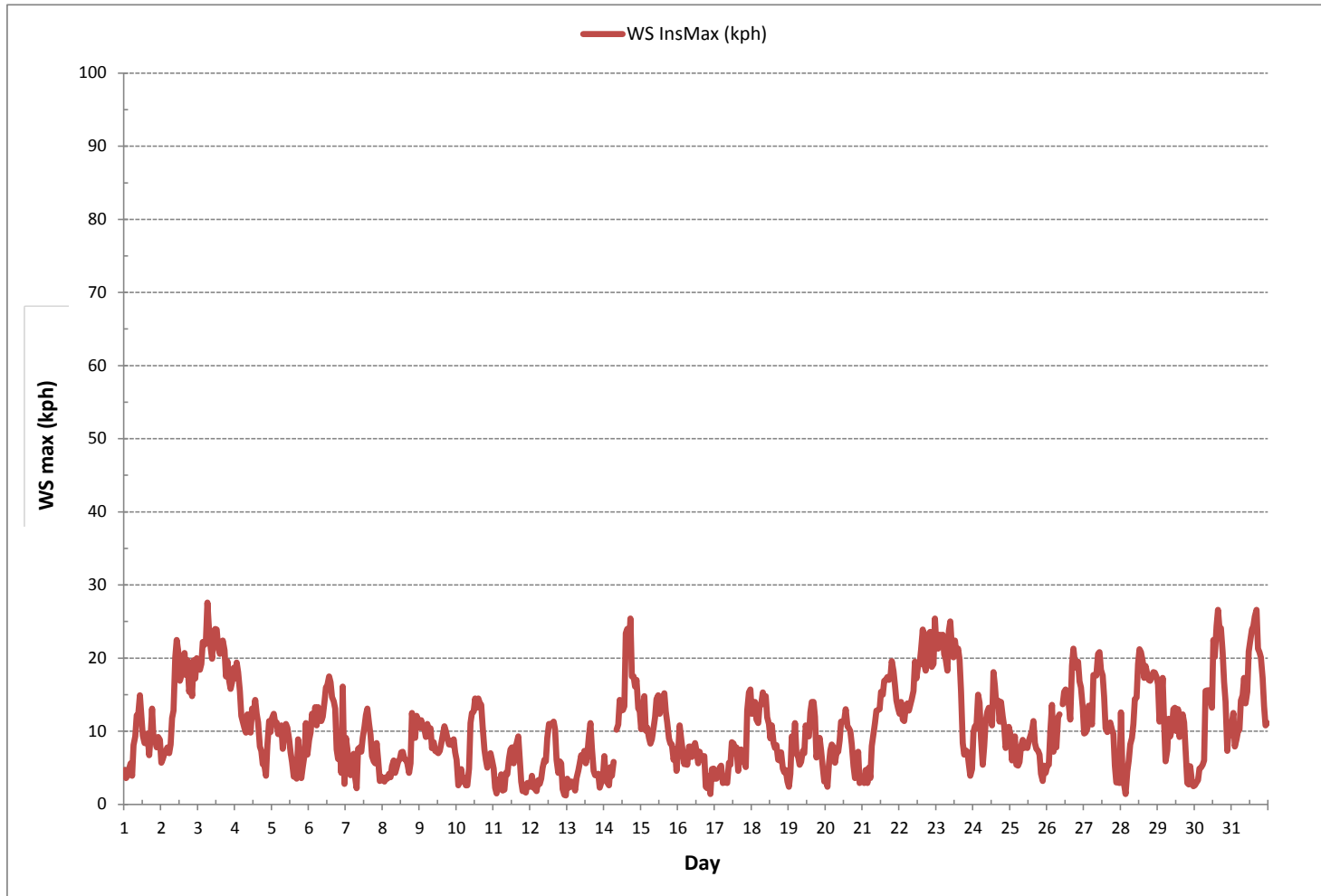
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	27.6	kph	@ HOUR	6	ON DAY	3
OPERATIONAL TIME:		742 hrs				

WIND SPEED Instantaneous Maximum (WS kph)



APPENDIX V
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	COLD LAKE SOUTH CONTINUOUS MONITORING STATION
Name of the Representative of the Person Responsible	Position / Title of the Representative of the Person Responsible
Mike Bisaga	Environment Monitoring Program Manager
Is an External Party Certifying the Report?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Name of External Person Certifying the Report	Position / Title of External Person Certifying the Report
Wunmi Adekanmbi	Project Manager, Customer Service, Air Services
Company Name for External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
Maxxam Analytics, A Bureau Veritas Group Company	M.Sc., EPT., PMP

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.



Signature of the Representative of the Person Responsible / External Person Certifying the Report

April 30, 2018

Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-03-1-C</u>
Site: <u>Cold Lake South Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghalet</u>	Date <u>April 16, 2018</u>
Level 1 Primary Validation	<u>Maram Ghalet</u>	Date <u>April 16, 2018</u>
Level 2 Final Validation	<u>Maram Ghalet</u>	Date <u>April 30, 2018</u>
Level 3 Independent Data Review	<u>CSA-LMB</u>	Date <u>April 30, 2018</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.

Alberta Environment and Parks (AEP)
Air.Reporting@gov.ab.ca

May 2, 2018

Subject: Monthly Report Submission for the LICA Maskwa station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA Maskwa AQM Station in the month of March 2018.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics

All data collected this month was compliant with the requirements outlined in the AMD, 2016.

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement systems.

A station audit was conducted by Alberta Environment and Parks (AEP) on March 15. The audit report can be found in this monthly report.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we have verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also verify all air data that are required by the AMD to be electronically submitted to AEP and Alberta's Ambient Air Quality Data Warehouse have been submitted by the time of this report submission.

Should you have any questions, please don't hesitate to contact us.

Respectfully,





Lakeland Industry & Community Association
5107 50 St
Bonnyville, AB T9N 2J7

Michael Bisaga
Technical Program Manager
Lakeland Industry & Community Association
780-266-7068
mbisaga@otonabee.ca

A handwritten signature in blue ink, appearing to read "Lily Lin", is written over a light blue rectangular background.

Lily Lin
Data & Reporting Specialist
587-225-2248
rebbaca@gmail.com



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#1 2080 39 Ave. NE, Calgary, AB
T2E 6P7

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Toll Free 800-386-7247
Fax 403-219-3673

**AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
MASKWA CONTINUOUS MONITORING STATION**

JOB #: 2833-2018-03-30-C

March 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
5107 50 ST.
BONNYVILLE, ALBERTA
T9N 2J7

Attention: MIKE BISAGA

DATE: **April 26, 2018**

Prepared by: *Maram Ghaleb*

Maram Ghaleb, B.Sc.
Project Manager, Customer Service, Air Services

Reviewed by: *Wunmi Adekanmbi*

Wunmi Adekanmbi, M.Sc., EPT, PMP
Project Manager, Customer Service, Air Services

SUMMARY

In March 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the Maskwa Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by Lakeland Industry & Community Association.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association, Maskwa Continuous Monitoring Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Lakeland Industry & Community Association Maskwa Continuous Monitoring Station						MAXIMUM VALUES							OPERATIONAL TIME (%)
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	1-HOUR					24-HOUR		
	1-hr	24-hr	1-hr	24-hr		READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
SO ₂ (ppb)	172	48	0	0	1	8	7	9	2.8	WSW	2	4	100.0
H ₂ S (ppb)	10	3	0	0	0	1	7	9	2.8	WSW	0	1	100.0
THC (ppm)	-	-	-	-	2.15	2.85	13	8	2.6	NNE	2.47	13	100.0
NO ₂ (ppb)	159	-	0	-	3	21	11	6	1.0	SSW	8	11	100.0
NO (ppb)	-	-	-	-	1	19	8	8	0.5	NNE	3	8	100.0
NO _x (ppb)	-	-	-	-	4	37	8	8	0.5	NNE	9	8	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	66	90	23	19	4.6	S	83	21	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	942	954	31	1	5.8	NW	951	2	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-5.8	11.2	13	14	3.6	SE	0.5	14	100.0
PRECIPITATION (mm)	-	-	-	-	0.0	1.4	23	9	9.4	ESE	0.3	23	100.0
VECTOR WS (kph)	-	-	-	-	1.6	13.9	23	5.0	-	ESE	9.1	3	100.0
VECTOR WD (sec)	-	-	-	-	100 (E)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

H₂S 1-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 1-hour AAAQO of 10 ppb.

H₂S 24-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 24-hour AAAQO of 3 ppb.

NO₂ 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 15. The audit report can be found in Appendix III.
- The routine monthly calibration was performed on March 16.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 15. The audit report can be found in Appendix III.
- The routine monthly calibration was performed on March 16.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 15. The audit report can be found in Appendix III.
- The routine monthly calibration was performed on March 16.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 15. The audit report can be found in Appendix III.
- The routine monthly calibration was performed on March 16.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 15. The audit report can be found in Appendix III.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing from and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 15. The audit report can be found in Appendix III.

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 15. The audit report can be found in Appendix III.

PRECIPITATION (PRECIP)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 15. The audit report can be found in Appendix III.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 15. The audit report can be found in Appendix III.

2.0 Project Personnel

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

- Maxxam AIR SOP-00013: RM Young Wind Monitor Calibration
- Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
- Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
- Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
- Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

- Sulphur Dioxide - API 100E UV Fluorescent Analyzer
- Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
- Total Hydrocarbons - Thermo 51C FID Analyzer
- Oxides of Nitrogen - API 200A Chemiluminescent Analyzer
- Wind System - RM Young Unit
- Relative Humidity - Met One Unit
- Barometric Pressure - Met One Unit
- Ambient Temperature - Met One Unit
- Precipitation - Met One Unit
- Datalogger - ESC 8832

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

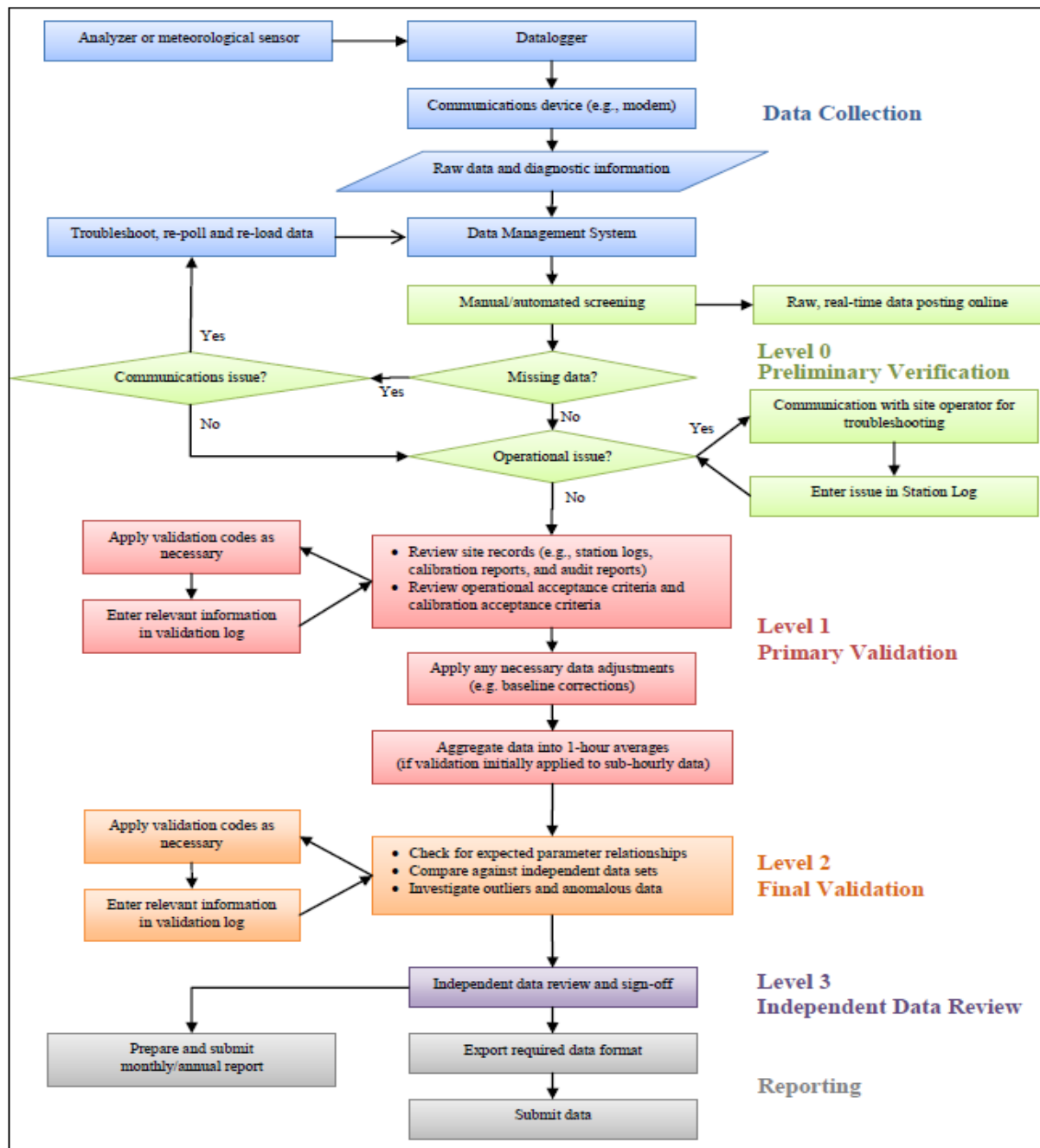
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
2	0	0	0	0	0	0	0	0	0	S	0	0	0	0	3	2	4	3	3	0	0	0	0	0	0	0	4	1	24
3	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	1	4	4	1	1	0	4	1	24	
4	1	1	1	5	6	5	S	4	4	5	2	4	3	1	1	3	1	0	1	1	0	0	0	0	0	6	2	24	
5	0	0	0	0	0	S	0	0	0	0	1	1	1	1	1	1	3	2	0	1	1	0	0	0	0	3	1	24	
6	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	24	
7	1	1	1	S	2	1	1	1	2	8	2	1	1	1	1	1	1	0	0	1	3	2	2	1	0	8	2	24	
8	1	1	S	0	0	0	0	0	0	1	2	2	2	1	1	1	1	1	1	1	2	1	1	1	0	2	1	24	
9	1	S	1	1	1	1	1	1	1	1	2	2	1	1	2	1	1	1	0	0	0	0	0	1	1	0	2	1	24
10	S	1	0	0	0	0	1	1	0	2	3	2	2	1	0	0	0	0	0	0	0	1	1	S	0	3	1	24	
11	1	1	0	0	0	1	2	0	0	0	0	2	1	0	0	0	1	1	1	1	0	0	S	0	0	2	1	24	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	1	0	1	0	24	
13	1	0	0	0	0	0	0	0	0	1	1	0	1	3	6	3	3	2	1	0	S	0	0	0	0	6	1	24	
14	0	0	0	1	0	1	0	0	4	3	1	1	3	4	4	6	5	0	S	0	1	5	2	0	0	6	2	24	
15	2	1	0	0	0	0	0	2	Q	Q	Q	2	3	2	2	2	3	2	S	3	7	7	1	1	0	7	2	24	
16	1	1	2	1	2	2	2	3	3	2	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	3	1	24	
17	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	S	0	0	0	0	0	0	0	2	0	24	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24	
19	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	24	
20	0	0	0	1	1	1	1	1	1	2	2	2	2	S	1	1	1	0	0	0	0	0	0	1	0	2	1	24	
21	1	0	1	0	0	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
22	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	2	4	1	1	1	2	5	6	3	0	6	1	24	
23	3	6	5	6	4	3	3	5	2	2	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2	24	
24	0	0	0	1	0	0	0	0	0	0	S	1	2	3	0	1	1	0	0	0	0	0	0	0	0	3	0	24	
25	0	1	0	0	0	0	0	0	S	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
26	0	0	0	0	0	0	0	0	S	0	0	1	1	1	1	2	2	1	0	1	1	1	1	2	2	2	1	24	
27	1	0	0	0	0	0	S	0	0	0	1	3	2	1	0	1	0	0	0	0	0	0	0	0	0	3	0	24	
28	0	0	0	0	0	S	0	0	0	1	0	1	1	2	1	1	2	7	2	1	1	0	0	0	0	7	1	24	
29	0	0	0	0	S	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
30	0	0	0	S	0	0	0	0	0	1	1	1	0	0	1	1	1	0	0	0	1	3	2	5	0	5	1	24	
31	7	2	S	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	24
HOURLY MAX	7	6	5	6	6	5	3	5	4	8	3	4	3	4	6	4	6	7	2	3	7	7	6	5	0	7	1	24	
HOURLY AVG	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	7	1	24	

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

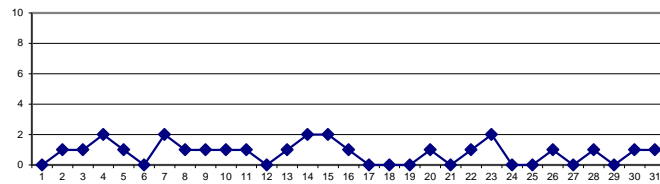
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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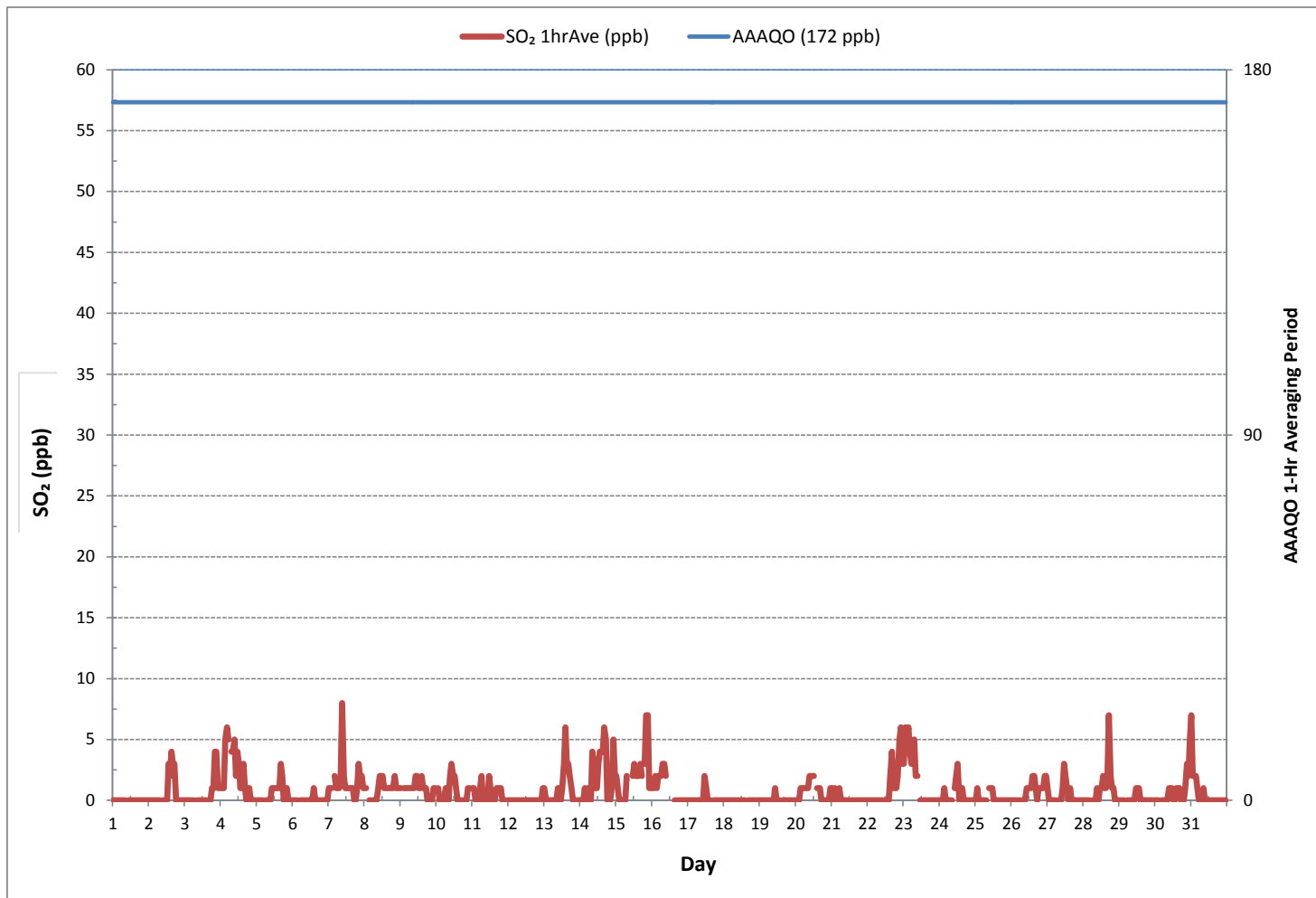
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	265		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR ON DAY 1		
MAXIMUM 1-HR AVERAGE:	8 ppb @ HOUR ON DAY 7		
MAXIMUM 24-HR AVERAGE:	2 ppb ON DAY 4		
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb

24 HR AVERAGES March 2018



SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-SO2[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 11.51%

Calm Avg: 0.24 [ppb]

Direction	0.0-1.8	1.8-3.6	3.6-5.4	5.4-7.2	7.2-9.0	>9.0	Total
N	4.7	0.1	0.0	0.0	0.0	0.0	4.8
NE	20.9	0.4	0.0	0.0	0.0	0.0	21.3
E	11.8	1.9	1.4	0.1	0.0	0.0	15.2
SE	6.4	2.6	0.9	1.1	0.1	0.0	11.1
S	5.5	0.4	0.0	0.0	0.0	0.0	6.0
SW	17.1	2.0	0.0	0.0	0.1	0.0	19.2
W	6.1	0.1	0.0	0.0	0.0	0.0	6.3
NW	3.3	1.0	0.1	0.3	0.0	0.0	4.7
Summary	75.7	8.5	2.4	1.6	0.3	0.0	88.5

% Icon Classes (ppb)

76 0.0-1.8

9 1.8-3.6

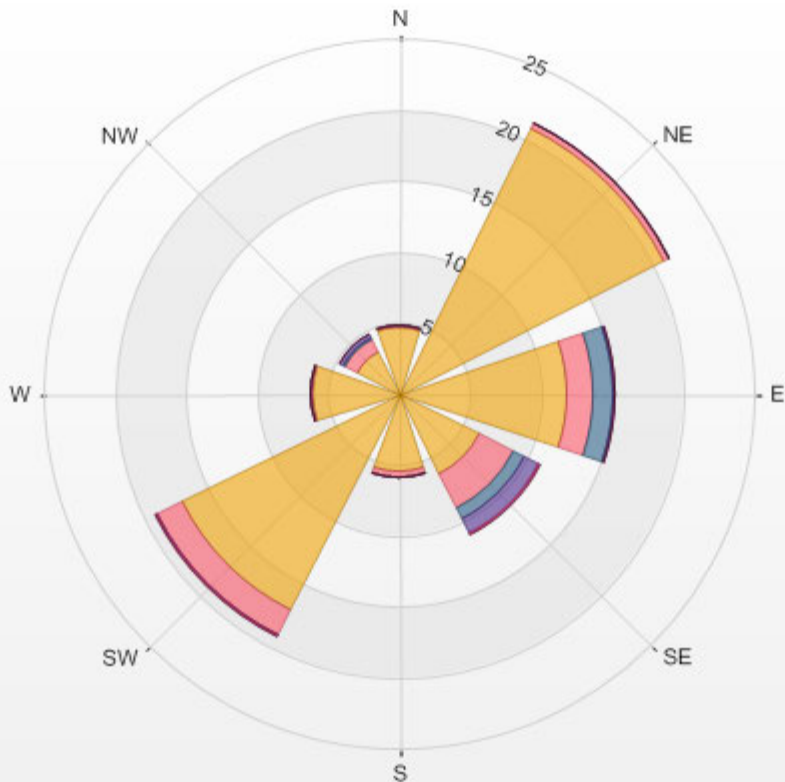
2 3.6-5.4

2 5.4-7.2

0 7.2-9.0

0 >9.0

LICA MASKWA Poll.: LICA MASKWA-SO2[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 11.51% Calm Poll Avg: 0.24[ppb]



SO2[ppb] Calibration: LICA MASKWA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
2	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
3	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
4	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
5	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
6	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
7	0	0	S	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
8	0	0	S	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
9	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
10	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
11	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24
13	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	24
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24
15	0	0	0	0	0	0	0	0	Q	Q	Q	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	24
16	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
21	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
23	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
24	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
25	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
27	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
28	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
29	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
31	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

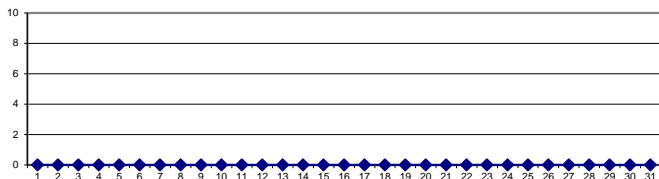
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	10	ppb	24-HR	3	ppb
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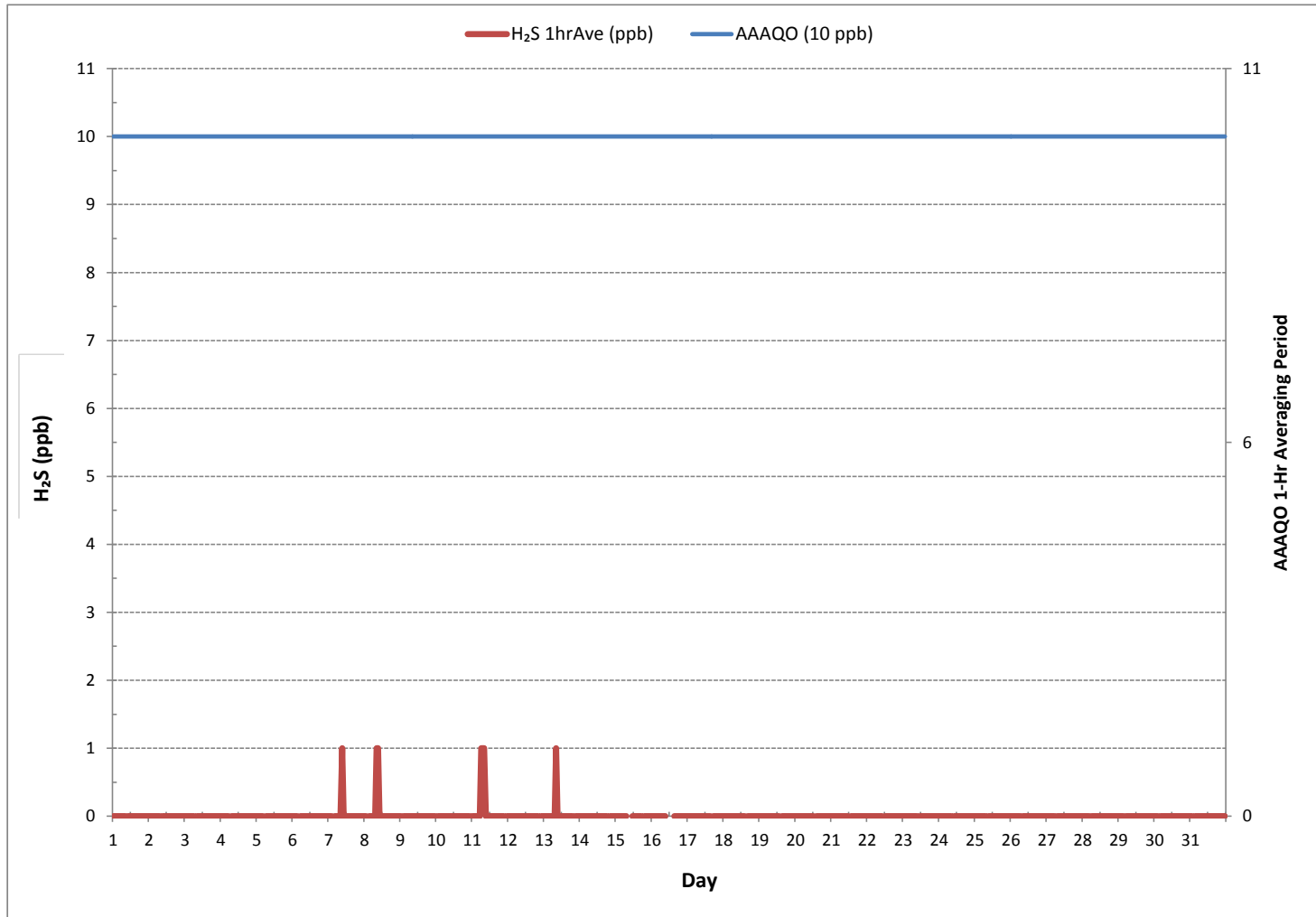
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF 24-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	7				
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR	0	ON DAY	1	
MAXIMUM 1-HR AVERAGE:	1 ppb @ HOUR	9	ON DAY	7	
MAXIMUM 24-HR AVERAGE:	0 ppb		ON DAY	1	
IZS CALIBRATION TIME:	31	hrs	OPERATIONAL TIME:	744	hrs
MONTHLY CALIBRATION TIME:	5	hrs	AMD OPERATION UPTIME:	100.0	%
STANDARD DEVIATION:	0		MONTHLY AVERAGE:	0	ppb

24 HR AVERAGES March 2018



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-H2S[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 11.51% Calm Avg: 0.17 [ppb]

Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	4.8	0.0	0.0	0.0	4.8
NE	21.3	0.0	0.0	0.0	21.3
E	15.2	0.0	0.0	0.0	15.2
SE	11.1	0.0	0.0	0.0	11.1
S	6.0	0.0	0.0	0.0	6.0
SW	19.2	0.0	0.0	0.0	19.2
W	6.3	0.0	0.0	0.0	6.3
NW	4.7	0.0	0.0	0.0	4.7
Summary	88.5	0.0	0.0	0.0	88.5

% Icon Classes (ppb)

89

0.0-0.7

0

0.7-1.3

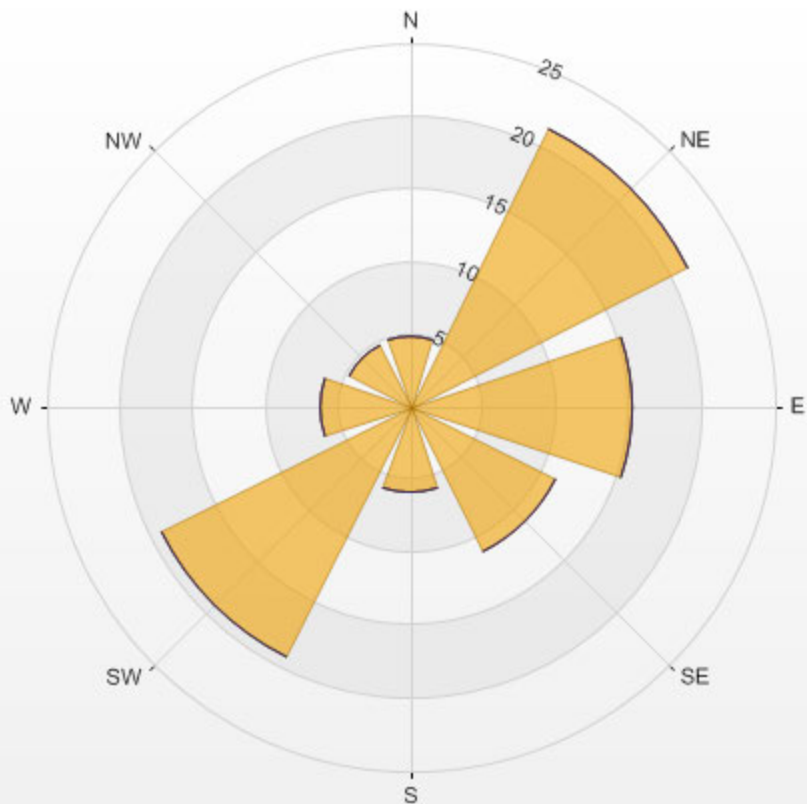
0

1.3-2.0

0

>2.0

LICA MASKWA Poll.: LICA MASKWA-H2S[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 11.51% Calm Poll Avg: 0.17[ppb]



H2S[ppb] Calibration: LICA MASKWA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON



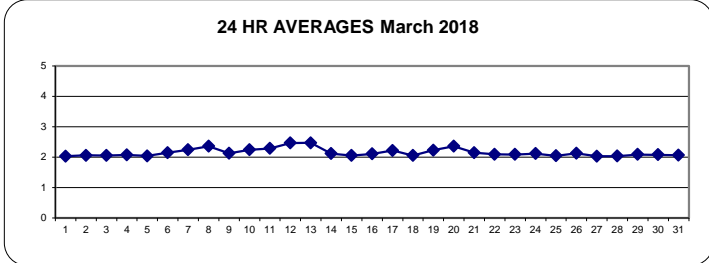
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

Table with 28 columns representing hourly data from 0:00 to 23:00 MST, and 31 rows representing days. Includes status flags like S, Q, C, X, G, P and summary statistics like HOURLY MAX and HOURLY AVG.

STATUS FLAG CODES

Legend for status flags: C - MONTHLY CALIBRATION, C1 - REPEAT CALIBRATION, Y - MAINTENANCE, S - DAILY ZERO/SPAN CHECK, S1 - REPEAT ZERO/SPAN CHECK, Q - QUALITY ASSURANCE, R - RECOVERY, X - MACHINE MALFUNCTION, G - OUT FOR REPAIR, P - POWER FAILURE

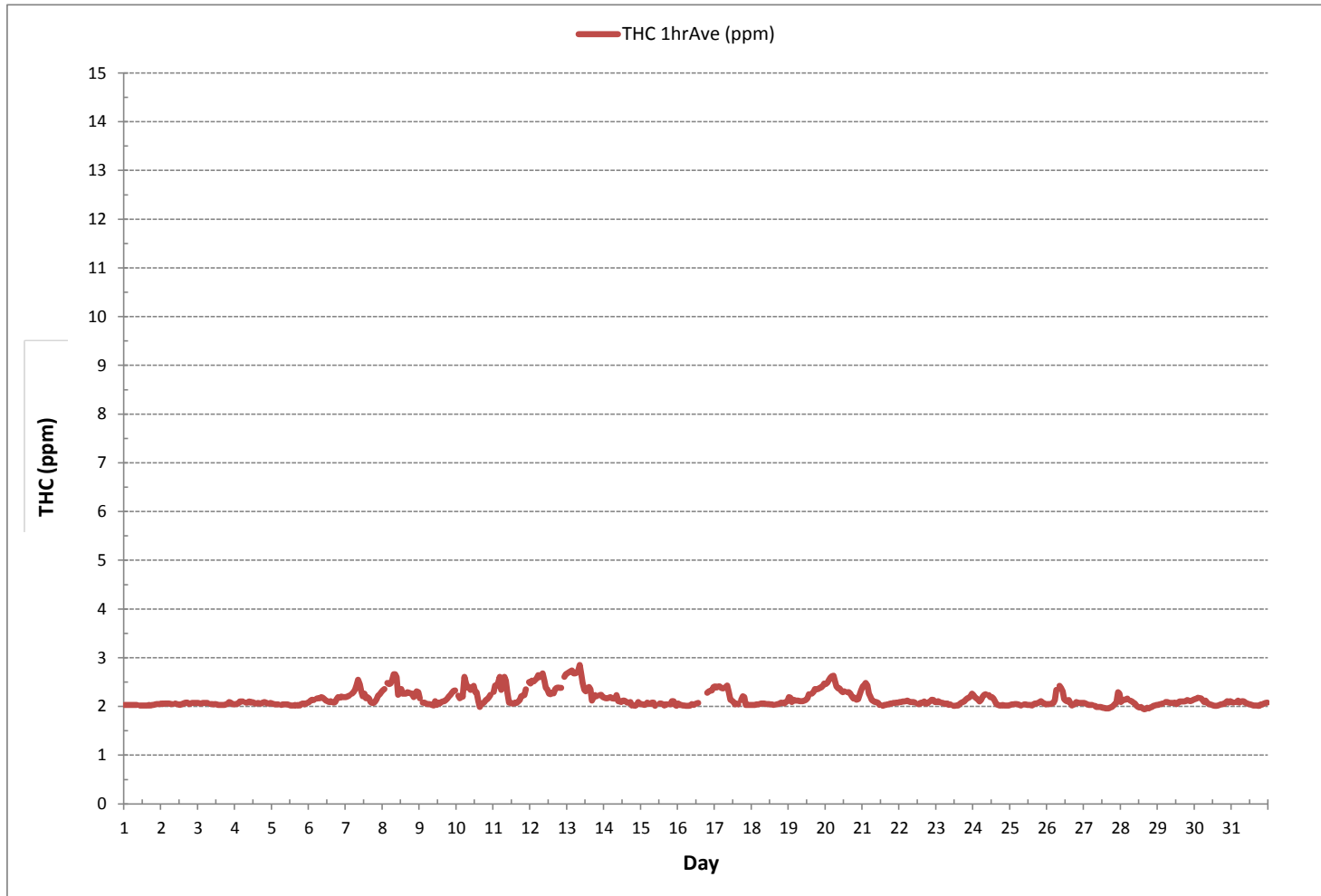
24 HR AVERAGES March 2018



MONTHLY SUMMARY

Summary statistics table including: NUMBER OF NON-ZERO READINGS: 706; MINIMUM 1-HR AVERAGE: 1.94 ppm; MAXIMUM 1-HR AVERAGE: 2.85 ppm; MAXIMUM 24-HR AVERAGE: 2.47 ppm; IZS CALIBRATION TIME: 31 hrs; MONTHLY CALIBRATION TIME: 5 hrs; STANDARD DEVIATION: 0.16; OPERATIONAL TIME: 744 hrs; AMD OPERATION UPTIME: 100.0%; MONTHLY AVERAGE: 2.15 ppm.

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-THC[ppm]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 11.49% Calm Avg: 2.32 [ppm]

Direction	0.0-1.0	1.0-1.9	1.9-2.9	>2.9	Total
N	0.0	0.0	4.8	0.0	4.8
NE	0.0	0.0	21.3	0.0	21.3
E	0.0	0.0	15.2	0.0	15.2
SE	0.0	0.0	11.1	0.0	11.1
S	0.0	0.0	6.0	0.0	6.0
SW	0.0	0.0	19.3	0.0	19.3
W	0.0	0.0	6.2	0.0	6.2
NW	0.0	0.0	4.7	0.0	4.7
Summary	0.0	0.0	88.5	0.0	88.5

% Icon Classes (ppm)

0

0.0-1.0

0

1.0-1.9

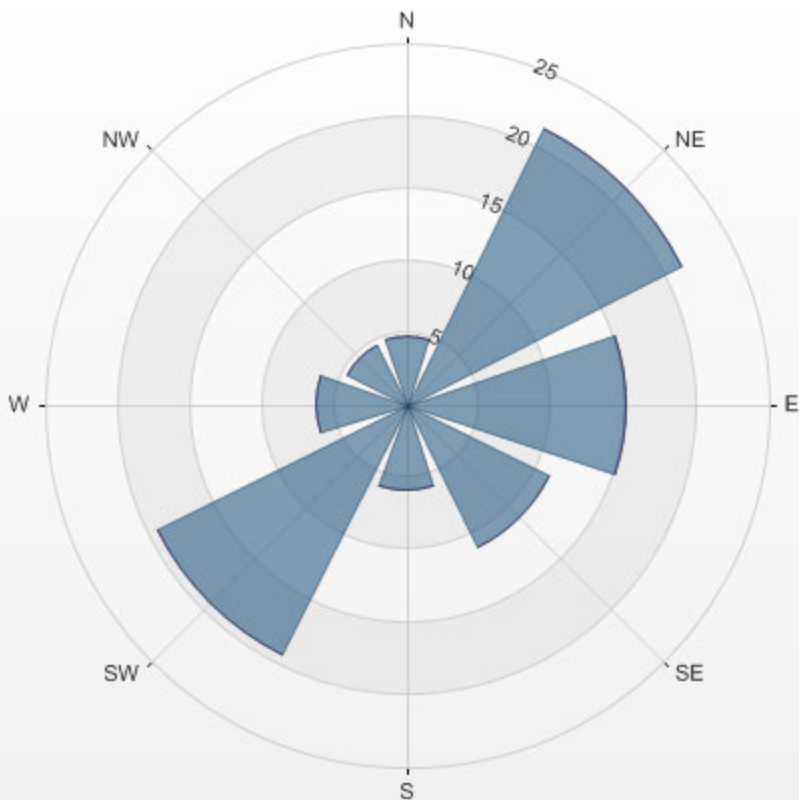
89

1.9-2.9

0

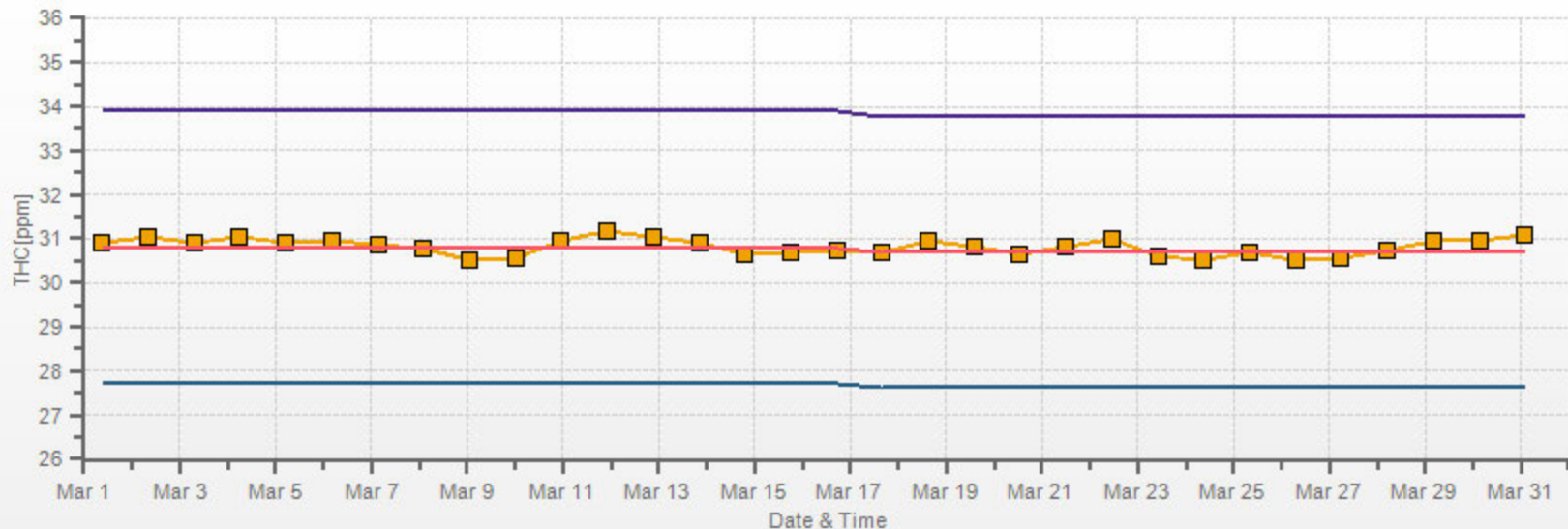
>2.9

LICA MASKWA Poll.: LICA MASKWA-THC[ppm] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 11.49% Calm Poll Avg: 2.32[ppm]



THC[ppm] Calibration: LICA MASKWA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



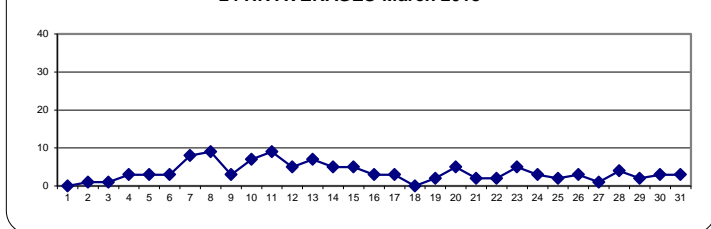
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
2	0	0	0	0	0	0	0	0	0	S	1	1	1	1	4	3	6	5	4	0	0	0	0	0	0	6	1	24	
3	0	1	0	0	0	0	0	0	S	1	1	1	1	1	1	1	1	1	2	1	7	7	3	1	0	7	1	24	
4	2	2	2	7	8	6	S	6	5	7	3	5	4	3	2	4	2	1	2	2	1	1	0	0	0	8	3	24	
5	0	0	0	0	1	S	1	1	3	3	2	3	1	3	3	4	9	8	4	3	4	2	2	2	0	9	3	24	
6	2	1	1	1	S	5	5	5	4	5	3	2	1	1	6	3	2	3	2	2	2	3	3	3	1	6	3	24	
7	3	4	5	S	8	7	10	16	18	31	12	8	6	6	6	4	3	3	4	6	5	6	6	3	3	31	8	24	
8	6	13	S	7	6	6	8	23	37	34	10	7	6	6	5	5	4	3	3	2	2	2	2	2	2	37	9	24	
9	4	S	4	3	2	1	2	2	1	2	3	3	6	4	8	5	3	2	2	2	2	3	4	11	1	11	3	24	
10	S	11	6	2	2	2	8	16	13	11	14	13	10	9	5	1	3	3	4	4	4	6	7	S	1	16	7	24	
11	8	14	15	33	13	9	23	22	23	15	4	5	3	2	2	1	2	3	4	3	3	4	S	5	1	33	9	24	
12	5	5	4	4	3	4	7	11	10	5	4	3	3	2	3	3	3	4	4	3	8	S	4	4	2	11	5	24	
13	4	4	3	3	3	3	23	19	24	8	5	4	5	11	14	7	7	6	3	2	S	2	1	1	1	24	7	24	
14	1	1	1	2	1	2	1	2	10	8	4	4	7	8	7	6	9	9	1	S	2	4	11	4	1	1	11	5	24
15	5	4	2	1	1	1	2	6	Q	Q	Q	Q	8	7	6	4	6	5	S	6	14	13	3	1	1	14	5	24	
16	2	2	4	1	1	2	2	5	4	4	C	C	C	C	C	C	C	C	C	4	4	4	4	3	1	5	3	24	
17	3	3	3	4	5	4	4	5	4	3	3	5	3	1	1	S	2	4	3	1	0	0	0	0	0	5	3	24	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	2	1	1	0	1	0	2	0	24	
19	2	2	1	1	1	1	1	1	2	2	4	3	2	3	S	3	3	4	3	3	3	3	3	3	1	4	2	24	
20	3	3	3	4	4	5	6	5	5	8	7	7	7	S	6	5	5	4	4	3	3	4	5	3	3	8	5	24	
21	6	7	10	6	2	2	1	1	1	1	1	1	S	1	1	1	1	0	0	0	0	0	0	0	0	10	2	24	
22	0	0	0	0	0	0	0	0	0	0	0	S	1	1	2	4	8	3	2	2	4	9	12	7	0	12	2	24	
23	7	12	11	11	8	7	9	12	7	7	S	2	2	2	2	2	3	2	4	3	2	2	1	1	1	12	5	24	
24	1	2	2	4	2	3	3	3	3	S	6	7	8	3	6	4	3	1	1	1	1	1	1	0	0	8	3	24	
25	1	3	2	2	1	1	1	1	S	3	4	3	2	1	1	1	2	2	2	2	2	1	1	0	0	4	2	24	
26	0	0	0	0	1	1	3	S	6	6	7	7	6	5	7	8	6	2	3	3	2	2	3	2	0	8	3	24	
27	2	1	1	1	1	0	S	1	1	1	2	3	3	2	1	1	0	1	1	0	0	1	2	5	0	5	1	24	
28	2	2	2	1	2	S	11	9	6	5	2	2	2	5	1	2	5	16	6	1	1	0	0	0	0	16	4	24	
29	0	0	0	0	S	0	2	1	0	1	1	5	5	5	2	2	2	2	2	2	2	2	3	0	0	5	2	24	
30	2	3	3	S	3	1	2	3	1	2	1	2	1	1	2	2	3	1	1	0	5	11	7	15	0	15	3	24	
31	19	9	S	6	7	1	3	6	7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	3	24	
HOURLY MAX	19	14	15	33	13	9	23	23	37	34	14	13	10	11	14	8	9	16	6	6	14	13	12	15					
HOURLY AVG	3	4	3	4	3	3	5	6	7	6	4	4	4	3	4	3	3	3	2	2	3	3	3	3					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

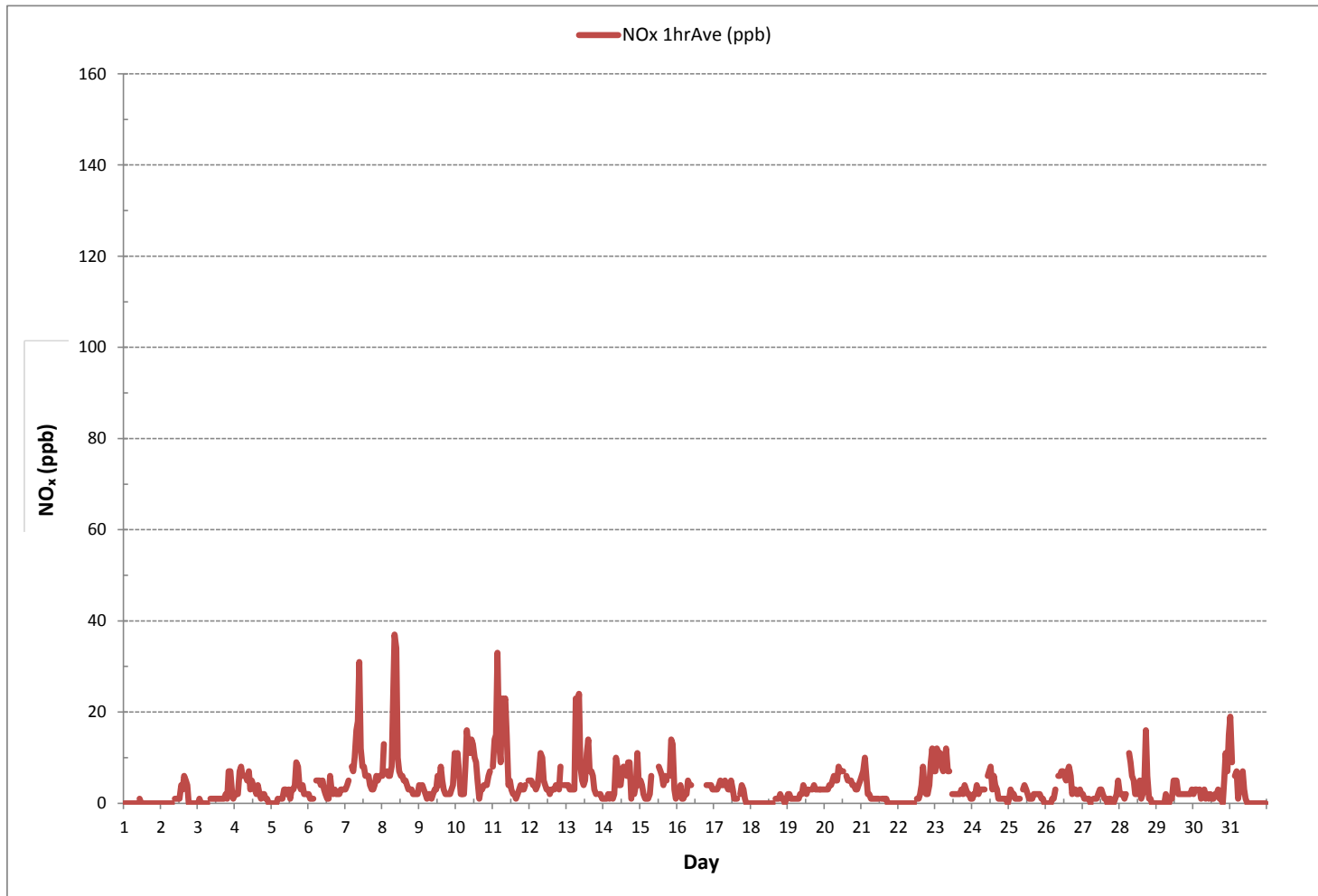
24 HR AVERAGES March 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	582			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	37 ppb	@ HOUR	8	ON DAY 8
MAXIMUM 24-HR AVERAGE:	9 ppb			ON DAY 8
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	9 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	4	MONTHLY AVERAGE:	4 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



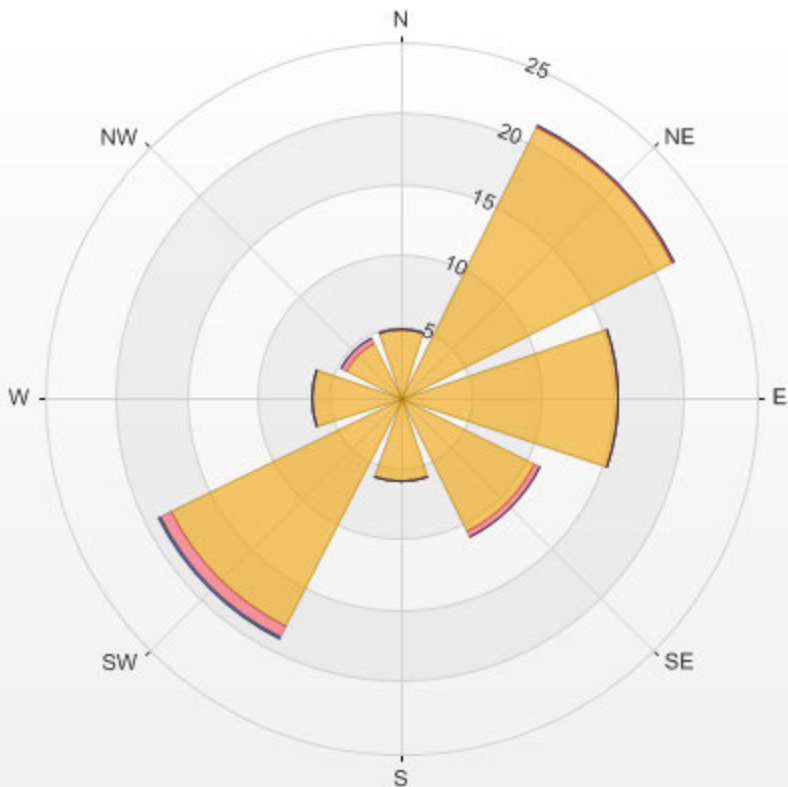
Wind: LICA MASKWA
 Poll.: LICA MASKWA-NOX[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 11.57% Calm Avg: 6.56 [ppb]

Direction	0.0-12.7	12.7-25.3	25.3-38.0	>38.0	Total
N	4.9	0.0	0.0	0.0	4.9
NE	21.3	0.1	0.0	0.0	21.4
E	15.3	0.0	0.0	0.0	15.3
SE	10.6	0.4	0.0	0.0	11.0
S	5.9	0.0	0.0	0.0	5.9
SW	18.0	0.9	0.1	0.0	19.0
W	6.3	0.0	0.0	0.0	6.3
NW	4.3	0.4	0.0	0.0	4.7
Summary	86.5	1.9	0.1	0.0	88.5

% Icon	Classes (ppb)	86		0.0-12.7	2		12.7-25.3	0		25.3-38.0	0		>38.0
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LICA MASKWA Poll.: LICA MASKWA-NOX[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 11.57% Calm Poll Avg: 6.56[ppb]



NOX[ppb] Calibration: LICA MASKWA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES

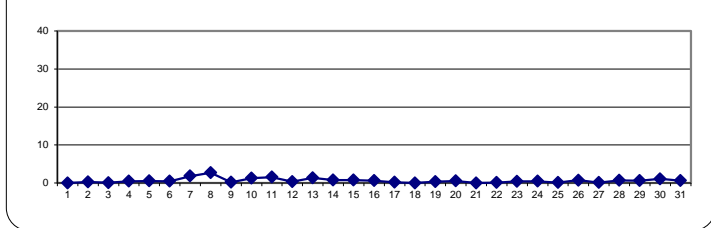
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
2	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	2	1	2	1	1	0	0	0	0	0	0	2	0	24
3	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	24
4	0	0	0	1	1	1	S	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	24
5	0	0	0	0	0	S	0	0	1	1	1	1	1	1	1	1	2	3	1	0	0	0	0	0	0	0	3	1	24
6	0	0	0	0	S	1	0	2	1	2	1	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0	2	0	24
7	0	0	0	S	0	0	0	3	6	15	5	3	3	2	2	2	1	0	0	0	0	0	0	0	0	0	15	2	24
8	0	4	S	0	1	1	1	6	19	17	4	2	2	2	2	2	1	1	0	0	0	0	0	0	0	19	3	24	
9	0	S	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	2	0	2	0	24	
10	S	0	0	0	0	0	0	3	3	4	6	5	3	3	1	0	0	0	0	0	0	0	0	S	0	6	1	24	
11	0	1	1	13	1	0	1	3	8	5	1	1	1	0	0	0	0	0	0	0	0	0	0	S	0	13	2	24	
12	0	0	0	0	0	0	0	2	2	1	1	1	0	0	0	0	0	0	0	0	0	1	S	0	0	2	0	24	
13	0	0	0	0	0	0	3	6	8	2	1	1	1	3	3	1	1	0	0	0	S	0	1	0	0	8	1	24	
14	0	0	0	1	0	0	0	0	2	2	1	1	2	2	2	1	2	1	2	1	0	S	0	1	0	0	2	1	24
15	0	0	0	0	0	1	0	1	Q	Q	Q	Q	3	2	2	1	1	1	S	1	1	1	0	0	0	3	1	24	
16	1	0	1	1	1	1	1	1	1	1	C	C	C	C	C	C	C	C	C	C	0	0	0	0	0	1	1	24	
17	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24
19	1	0	0	0	0	0	0	0	1	1	1	1	1	1	S	0	0	1	0	0	0	0	0	0	0	1	0	24	
20	0	0	0	0	0	0	0	1	1	2	2	2	2	S	1	1	1	0	0	0	0	0	0	0	0	2	1	24	
21	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	1	0	0	0	0	0	1	0	0	1	0	24	
23	0	1	1	1	1	1	1	2	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
24	0	0	0	0	0	0	0	1	1	S	1	2	2	0	2	1	1	0	0	0	0	0	0	0	0	2	0	24	
25	0	0	0	0	0	0	0	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
26	0	0	0	0	1	1	1	S	1	1	2	2	2	1	2	2	1	0	0	0	0	0	0	0	0	2	1	24	
27	0	0	0	0	0	0	S	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24	
28	0	0	0	0	0	S	2	2	2	1	0	1	0	2	0	1	4	1	0	0	0	0	0	0	0	4	1	24	
29	0	0	0	0	S	0	0	0	0	0	1	3	2	3	1	1	1	1	0	0	0	0	1	1	0	3	1	24	
30	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	0	3	1	24
31	4	3	S	1	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	24	
HOURLY MAX	4	4	1	13	1	1	3	6	19	17	6	5	3	3	3	2	3	4	1	1	1	1	1	2	3				
HOURLY AVG	0	0	0	1	0	0	0	1	2	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

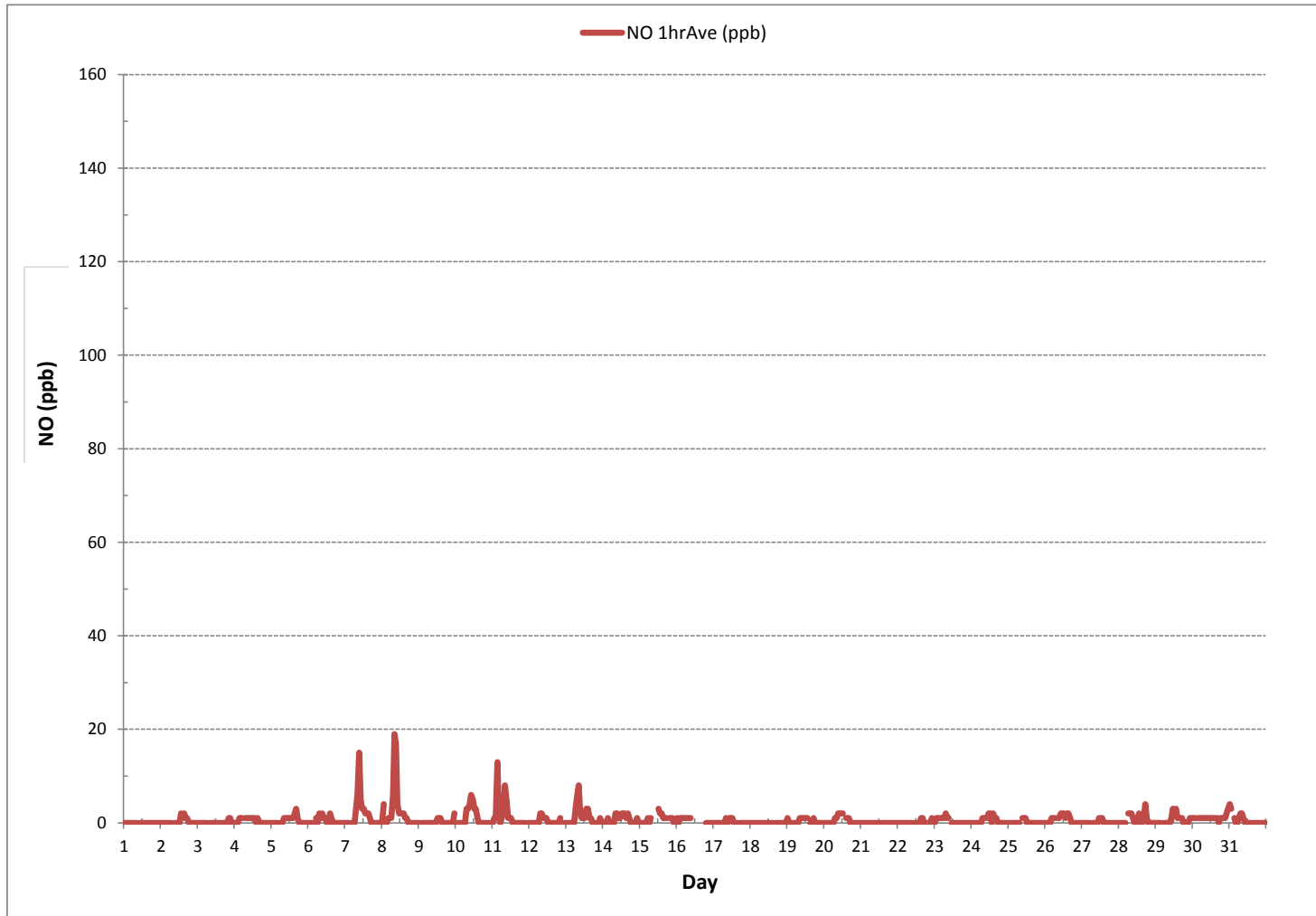
24 HR AVERAGES March 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	240			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	19 ppb	@ HOUR	8	ON DAY 8
MAXIMUM 24-HR AVERAGE:	3 ppb			ON DAY 8
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	9 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	1 ppb	

NITRIC OXIDE Hourly Averages (NO ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 11.57% Calm Avg: 1.35 [ppb]

Direction	0.0-6.7	6.7-13.3	13.3-20.0	>20.0	Total
N	4.9	0.0	0.0	0.0	4.9
NE	21.3	0.1	0.0	0.0	21.4
E	15.3	0.0	0.0	0.0	15.3
SE	11.0	0.0	0.0	0.0	11.0
S	5.9	0.0	0.0	0.0	5.9
SW	18.9	0.0	0.1	0.0	19.0
W	6.3	0.0	0.0	0.0	6.3
NW	4.7	0.0	0.0	0.0	4.7
Summary	88.2	0.1	0.1	0.0	88.4

% Icon Classes (ppb)

88

0.0-6.7

0

6.7-13.3

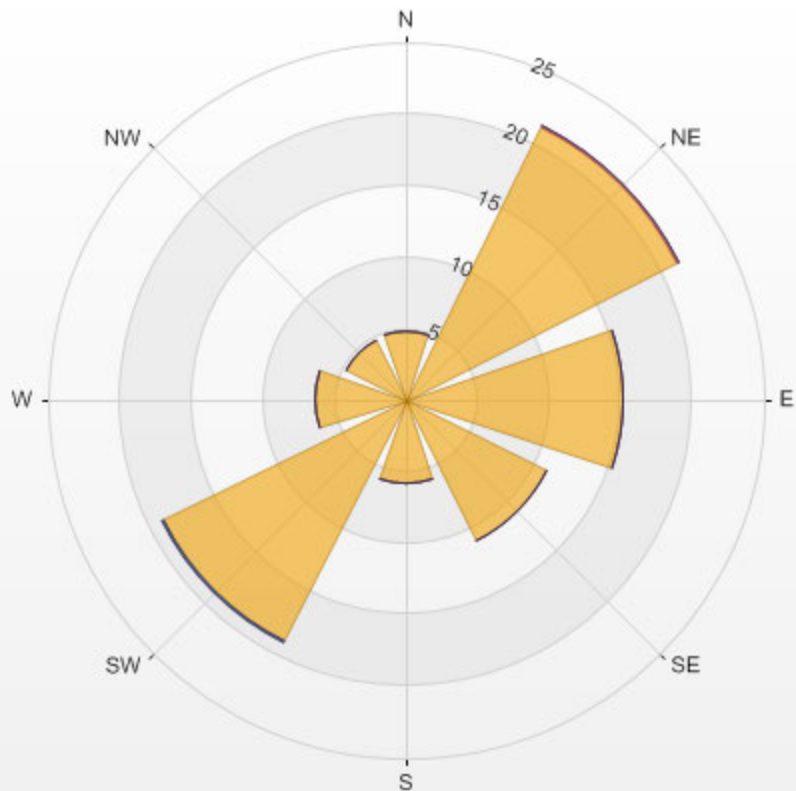
0

13.3-20.0

0

>20.0

LICA MASKWA Poll.: LICA MASKWA-NO[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 11.57% Calm Poll Avg: 1.35[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
2	0	0	0	0	0	0	0	0	0	S	1	1	1	1	3	2	4	4	4	0	0	0	0	0	0	0	0	0	4	1	24	
3	0	0	0	0	0	0	0	0	S	1	0	1	1	1	0	1	0	1	2	1	6	7	2	1	0	0	0	7	1	24		
4	2	1	2	7	7	5	S	5	4	6	3	4	3	2	2	3	2	1	2	2	1	0	0	0	0	0	0	7	3	24		
5	0	0	0	0	0	S	1	1	2	2	2	2	1	2	2	3	7	7	3	3	3	2	2	2	2	0	0	7	2	24		
6	2	1	1	1	S	4	4	4	3	3	2	1	1	1	3	2	1	2	2	2	2	3	3	3	3	1	4	4	2	24		
7	3	4	5	S	8	7	10	13	12	16	7	5	5	4	4	4	3	2	3	4	5	5	5	6	2	16	6	6	24			
8	6	10	S	7	6	5	8	18	18	16	6	4	4	4	4	3	3	3	2	3	2	2	2	2	2	2	16	6	6	24		
9	4	S	3	3	1	1	2	2	1	2	3	3	5	3	7	4	3	2	2	2	2	3	4	9	1	9	3	3	24			
10	S	11	6	2	2	2	8	14	10	8	9	8	7	6	4	1	3	3	4	4	4	6	7	S	1	14	6	24				
11	8	14	14	20	12	8	21	19	15	10	3	2	1	2	1	2	3	4	4	3	3	4	S	5	1	21	8	24				
12	5	5	4	4	3	4	7	9	7	5	3	3	3	2	2	3	3	4	4	3	7	S	4	4	2	9	4	24				
13	4	4	3	3	3	2	20	13	16	6	4	3	4	8	11	6	6	5	3	2	S	2	1	1	1	20	6	24				
14	1	1	1	2	1	1	1	2	8	6	3	3	5	6	6	5	7	8	1	S	2	3	10	4	1	10	4	24				
15	5	4	1	1	1	1	2	5	Q	Q	Q	Q	5	5	4	3	5	4	S	5	14	12	2	1	1	14	4	24				
16	2	1	4	1	1	1	2	4	3	3	C	C	C	C	C	C	C	C	C	3	4	4	4	3	1	4	3	24				
17	3	3	3	3	5	4	4	4	2	2	4	2	1	1	0	S	2	4	3	1	0	0	0	0	0	5	2	24				
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	0	1	1	1	0	0	0	0	1	0	24				
19	1	1	0	1	0	0	1	1	1	1	3	2	2	2	S	2	2	3	3	3	3	3	3	3	3	3	2	24				
20	3	3	3	4	4	5	5	4	7	5	5	5	S	5	4	5	4	4	4	3	3	4	4	4	3	7	4	24				
21	6	7	9	6	2	2	1	1	1	1	1	1	S	1	1	1	1	0	0	0	0	0	0	0	0	9	2	24				
22	0	0	0	0	0	0	0	0	0	0	S	1	1	1	2	3	6	3	2	2	4	9	11	6	0	11	2	24				
23	7	11	10	10	7	7	8	10	6	6	S	1	2	1	2	2	3	2	4	3	2	2	2	1	1	11	5	24				
24	1	2	2	3	2	2	2	2	2	S	4	5	6	3	4	3	2	1	1	1	1	1	0	0	0	6	2	24				
25	1	3	2	2	1	1	1	1	S	3	3	2	1	1	1	1	2	2	2	2	2	1	1	0	0	3	2	24				
26	0	0	0	0	0	0	2	S	5	5	5	4	4	4	5	6	4	2	3	3	2	2	3	2	0	6	3	24				
27	1	1	1	0	0	0	S	1	0	0	1	2	2	2	1	1	0	1	1	0	0	1	2	5	0	5	1	24				
28	2	2	2	1	2	S	9	7	4	3	2	2	4	1	2	3	12	5	1	1	0	0	0	0	0	12	3	24				
29	0	0	0	0	S	0	1	1	0	0	1	3	3	3	1	1	1	2	2	1	1	1	1	3	0	3	1	24				
30	2	2	2	S	2	1	1	2	0	0	0	1	0	0	1	1	0	0	0	0	4	10	5	12	0	12	2	24				
31	15	6	S	5	6	1	2	4	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	2	24			
HOURLY MAX	15	14	14	20	12	8	21	19	18	16	9	8	7	8	11	6	7	12	5	5	14	12	11	12								
HOURLY AVG	3	3	3	3	3	2	4	5	5	4	3	3	3	2	3	2	3	3	2	2	3	3	3	3								

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

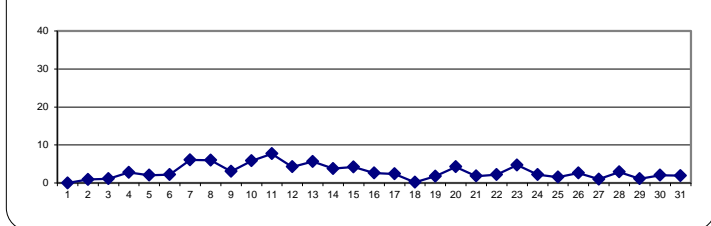
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

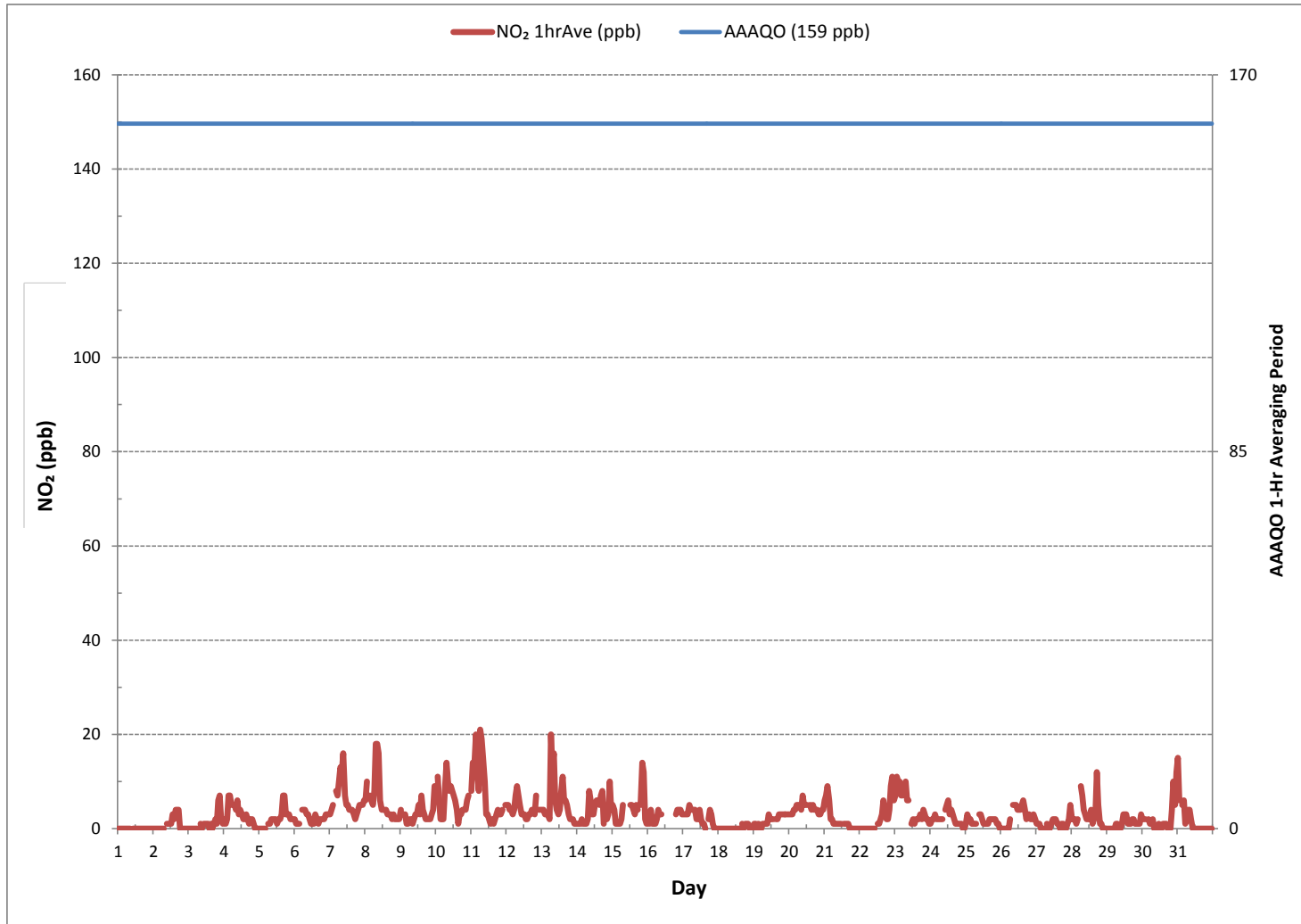
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0			
NUMBER OF NON-ZERO READINGS:	552			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	0	ON DAY 1
MAXIMUM 1-HR AVERAGE:	21 ppb	@ HOUR	6	ON DAY 11
MAXIMUM 24-HR AVERAGE:	8 ppb			ON DAY 11
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	744 hrs	
MONTHLY CALIBRATION TIME:	9 hrs	AMD OPERATION UPTIME:	100.0 %	
STANDARD DEVIATION:	3	MONTHLY AVERAGE:	3 ppb	

24 HR AVERAGES March 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



Wind: LICA MASKWA
 Poll.: LICA MASKWA-NO2[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 11.57% Calm Avg: 5.21 [ppb]

Direction	0.0-7.3	7.3-14.7	14.7-22.0	>22.0	Total
N	4.9	0.0	0.0	0.0	4.9
NE	21.3	0.0	0.1	0.0	21.4
E	14.9	0.4	0.0	0.0	15.3
SE	9.3	1.7	0.0	0.0	11.0
S	5.7	0.1	0.0	0.0	5.9
SW	16.9	2.0	0.1	0.0	19.0
W	6.0	0.3	0.0	0.0	6.3
NW	4.1	0.4	0.1	0.0	4.7
Summary	83.0	5.0	0.4	0.0	88.4

% Icon Classes (ppb)

83

0.0-7.3

5

7.3-14.7

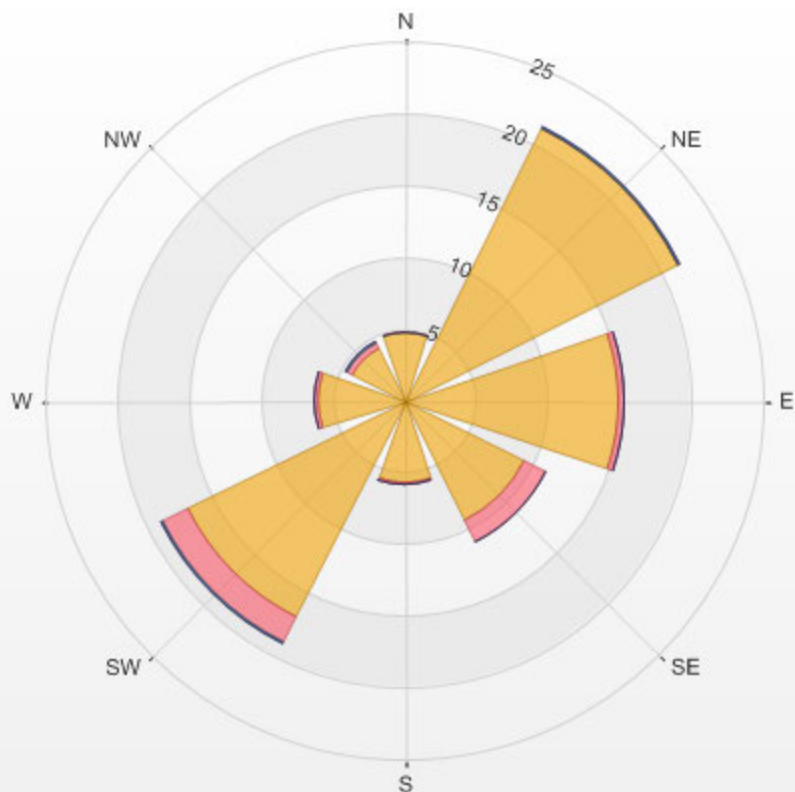
0

14.7-22.0

0

>22.0

LICA MASKWA Poll.: LICA MASKWA-NO2[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 11.57% Calm Poll Avg: 5.21[ppb]



NO2[ppb] Calibration: LICA MASKWA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



WIND SPEED

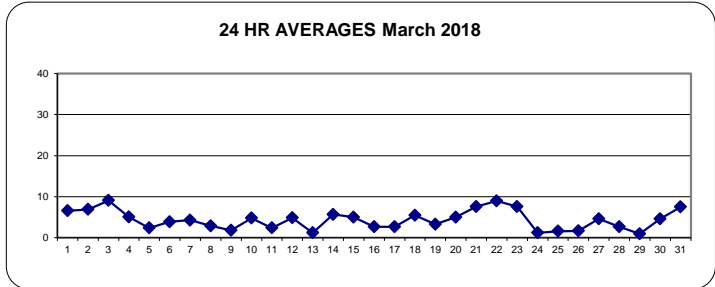
WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	4.1	3.6	3.7	3.7	3.8	4.5	4.3	4.7	6.0	7.6	9.6	10.5	8.9	9.6	10.4	10.2	10.3	8.6	6.4	5.4	4.4	6.8	6.9	5.3	3.6	10.5	6.6	24
2	5.2	4.6	4.9	3.9	5.5	6.0	4.6	4.7	6.3	7.3	9.9	8.5	10.9	9.8	9.9	10.4	11.7	8.1	9.1	7.4	6.9	5.9	7.8	7.2	3.9	11.7	6.9	24
3	5.9	8.4	8.5	9.2	9.2	10.4	10.2	8.6	7.0	9.4	10.3	11.0	11.2	11.5	11.5	9.3	9.7	9.3	8.8	8.9	8.8	7.4	8.4	8.9	5.9	11.5	9.1	24
4	8.9	7.9	8.4	7.1	7.8	7.3	5.8	5.4	6.0	5.8	6.0	6.1	5.7	6.4	4.8	4.1	2.8	2.2	2.2	0.7	4.5	6.5	7.3	6.4	0.7	8.9	5.1	24
5	7.6	7.9	5.8	3.9	4.3	6.0	3.6	3.3	1.5	2.9	4.0	4.4	3.9	2.8	2.8	2.7	2.7	1.5	3.4	2.1	1.3	2.1	0.6	2.2	0.6	7.9	2.4	24
6	2.8	3.6	3.8	3.0	2.3	2.4	2.8	3.0	2.9	3.6	4.4	5.9	7.1	7.5	6.8	5.3	4.7	3.4	6.7	5.8	6.7	6.4	4.4	4.5	2.3	7.5	3.9	24
7	5.7	4.9	4.6	5.5	2.9	3.6	5.0	4.2	3.7	2.8	2.0	1.8	5.0	6.1	7.9	7.3	7.7	6.4	4.2	3.4	3.9	3.0	1.7	2.9	1.7	7.9	4.3	24
8	2.6	1.6	1.9	0.6	0.5	0.1	0.8	0.5	0.5	0.6	4.1	6.0	3.4	5.4	5.8	5.9	5.2	4.4	4.4	4.3	5.6	5.9	5.1	7.3	0.1	7.3	2.9	24
9	7.7	7.1	7.4	6.7	5.8	6.3	6.4	6.0	5.0	4.1	2.3	2.4	1.3	1.8	3.2	3.0	3.6	4.0	4.2	3.9	2.6	3.7	3.4	3.0	1.3	7.7	1.8	24
10	3.3	2.5	2.8	1.8	2.5	1.0	4.9	6.4	6.0	4.5	6.0	7.4	8.1	8.1	5.6	5.5	7.7	6.4	6.5	5.7	5.2	5.1	3.5	3.6	1.0	8.1	4.8	24
11	5.0	2.8	0.2	1.1	1.0	1.1	1.0	0.1	0.7	1.2	5.1	2.7	5.7	5.4	6.9	6.4	7.4	4.1	3.6	1.6	2.6	1.1	1.8	4.2	0.1	7.4	2.4	24
12	2.1	0.4	0.9	2.4	2.4	2.1	0.2	0.4	2.3	5.2	6.1	6.7	10.9	11.7	10.3	11.6	10.6	6.9	3.3	3.3	4.1	4.1	5.2	5.3	0.2	11.7	4.9	24
13	5.3	1.8	0.8	1.0	0.3	0.6	0.7	0.3	2.6	2.6	3.1	4.6	3.7	4.3	3.6	4.4	4.3	3.2	1.3	2.6	3.0	3.6	3.4	3.9	0.3	5.3	1.2	24
14	3.4	4.1	3.7	3.5	4.2	3.4	4.1	3.1	5.4	7.7	8.3	9.0	7.6	8.5	8.9	8.3	9.8	6.6	5.4	6.7	6.6	6.1	6.4	5.9	3.1	9.8	5.7	24
15	4.4	3.9	3.2	2.8	2.3	2.3	2.0	2.4	6.3	7.4	6.5	7.6	8.2	7.1	6.8	7.1	8.3	6.8	5.4	6.1	5.6	4.9	5.6	4.2	2.0	8.3	5.0	24
16	3.1	4.4	3.9	3.6	2.2	3.2	2.3	2.7	1.8	4.7	4.8	4.6	5.0	4.7	6.4	6.6	6.8	4.7	2.5	0.7	0.9	1.1	0.2	0.3	0.2	6.8	2.7	24
17	0.8	1.1	0.9	2.3	1.0	0.2	1.0	0.2	1.5	4.9	4.2	4.2	2.9	5.2	6.1	5.8	4.3	2.8	1.8	3.2	8.7	7.9	7.8	8.3	0.2	8.7	2.7	24
18	8.2	9.3	9.3	9.1	9.0	7.5	7.7	8.9	9.3	9.0	6.9	5.7	5.3	5.9	5.7	4.5	4.6	3.4	2.6	2.6	2.0	2.9	2.8	1.6	1.6	9.3	5.5	24
19	2.2	1.1	2.5	2.1	2.7	2.0	1.9	1.7	3.5	3.1	4.5	4.6	5.6	6.7	7.3	7.6	7.0	8.0	5.8	4.6	6.0	6.8	5.4	5.3	1.1	8.0	3.3	24
20	5.2	5.2	6.5	4.6	3.1	5.3	5.4	5.5	4.5	4.2	4.7	4.2	5.1	5.1	8.3	8.9	7.3	6.8	5.8	4.4	2.9	1.9	2.0	3.7	1.9	8.9	5.0	24
21	1.7	0.4	1.5	2.9	4.5	6.3	6.7	7.2	7.4	9.2	10.3	8.9	10.4	10.9	10.7	11.1	10.7	11.0	9.8	10.3	9.1	8.5	8.6	8.3	0.4	11.1	7.6	24
22	7.8	7.9	7.9	8.1	8.8	8.2	8.0	8.3	8.7	8.5	9.5	9.4	6.7	8.3	11.1	11.7	13.3	10.6	11.7	12.3	12.6	12.7	11.4	12.6	6.7	13.3	9.0	24
23	12.4	11.6	12.7	12.3	12.4	13.9	12.1	11.4	10.6	9.4	10.6	7.4	9.7	9.0	7.9	7.2	5.5	5.7	4.7	4.6	3.6	1.7	0.3	1.1	0.3	13.9	7.6	24
24	2.2	2.0	3.0	3.1	4.9	4.5	4.4	5.3	5.1	4.2	5.0	3.1	3.6	5.4	5.5	4.6	4.7	4.5	3.7	3.4	4.1	4.9	3.8	3.1	2.0	5.5	1.2	24
25	4.2	8.6	6.1	3.6	1.1	1.7	4.2	3.8	4.1	3.1	3.5	3.7	3.0	3.2	4.9	3.9	2.9	2.8	0.1	2.7	2.6	3.7	3.8	4.9	0.1	8.6	1.6	24
26	4.4	3.9	2.9	2.6	1.3	0.4	5.4	6.3	5.1	5.9	5.8	5.5	5.1	5.7	6.4	6.4	7.2	7.2	8.2	11.4	11.3	10.4	9.5	8.2	0.4	11.4	1.7	24
27	5.0	4.9	5.9	4.9	5.7	7.2	6.7	6.9	6.5	6.9	9.9	7.4	7.7	7.8	5.7	5.2	7.2	6.4	5.6	1.5	0.6	1.5	0.9	1.9	0.6	9.9	4.6	24
28	2.0	2.1	2.0	1.9	2.3	2.7	3.7	3.6	4.4	5.1	7.5	7.0	9.1	6.5	6.9	7.1	7.7	8.7	6.2	6.8	8.7	10.5	11.2	9.1	1.9	11.2	2.7	24
29	5.4	6.3	5.5	4.0	2.7	1.1	1.3	5.4	5.8	3.1	1.6	2.0	3.0	5.4	10.7	10.1	9.6	7.8	5.3	3.9	1.1	0.2	0.2	0.4	0.2	10.7	1.0	24
30	1.1	1.0	0.3	1.4	1.5	3.0	0.9	4.4	8.3	9.7	7.9	8.0	8.2	8.9	8.7	7.7	8.0	8.3	8.0	5.1	3.4	5.0	5.2	5.0	0.3	9.7	4.6	24
31	5.2	5.8	5.7	5.5	6.5	6.5	7.7	8.0	8.1	8.9	8.8	10.0	11.0	11.4	12.0	10.9	11.3	9.4	5.8	5.3	4.6	4.5	4.1	5.6	4.1	12.0	7.5	24
HOURLY MAX	12.4	11.6	12.7	12.3	12.4	13.9	12.1	11.4	10.6	9.7	10.6	11.0	11.2	11.7	12.0	11.7	13.3	11.0	11.7	12.3	12.6	12.7	11.4	12.6				
HOURLY AVG	1.9	2.2	2.3	2.1	2.1	2.3	1.7	1.7	2.0	1.9	1.8	1.3	1.2	1.6	1.5	1.1	1.1	0.7	1.1	1.5	1.7	1.9	2.2	1.8				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

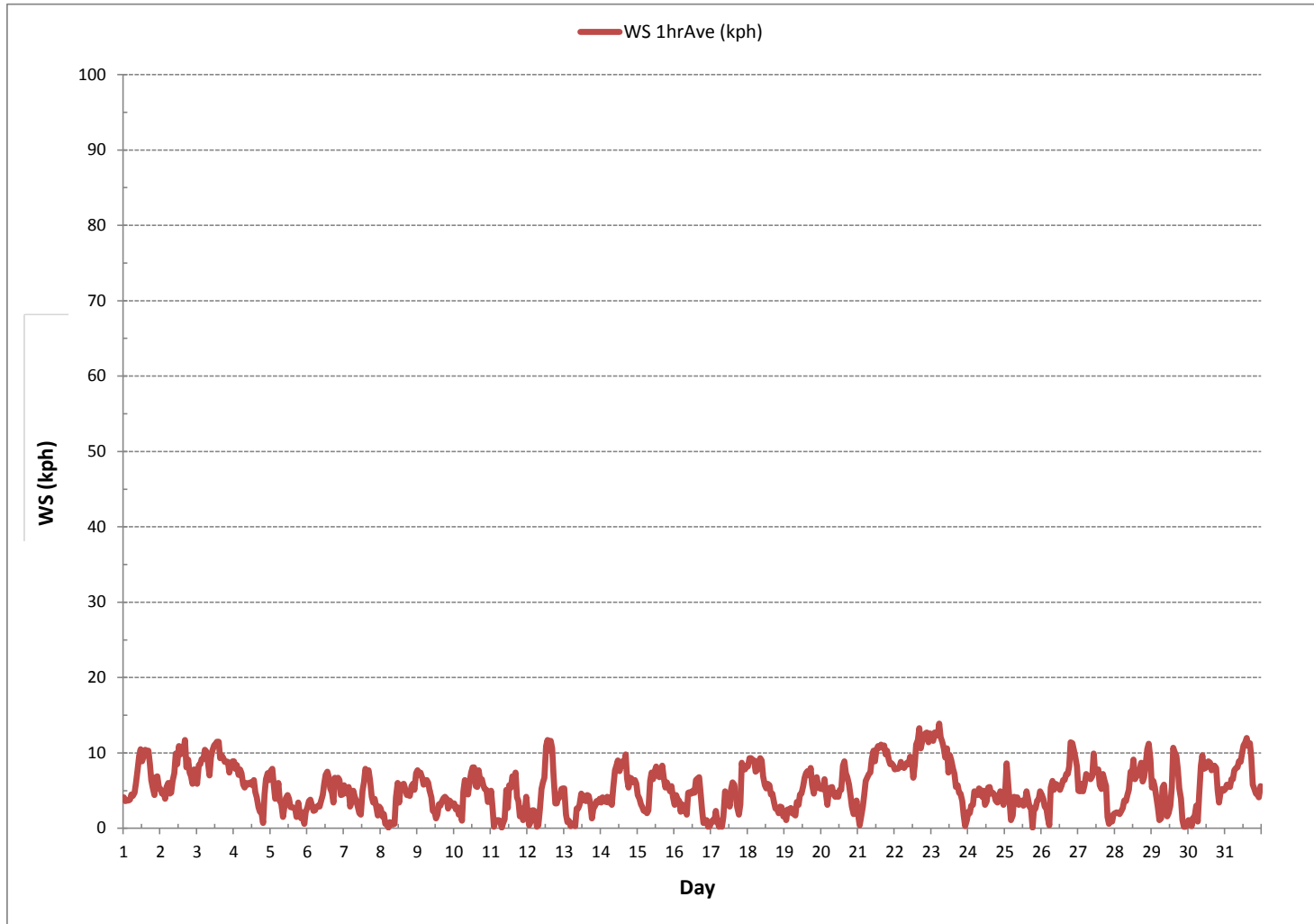
LAST CALIBRATION:	December 28, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE:	0.1 kph @ HOUR 5 ON DAY 8
MAXIMUM 1-HR AVERAGE:	13.9 kph @ HOUR 5 ON DAY 23
MAXIMUM 24-HR AVERAGE:	9.1 kph ON DAY 3
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	2.9
MONTHLY AVERAGE:	1.6 kph

WIND SPEED Hourly Averages (WS kph)



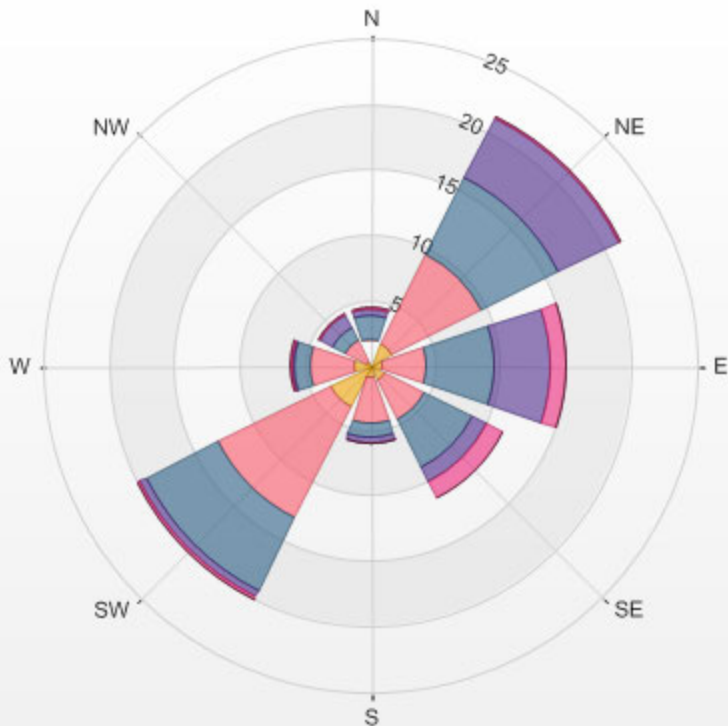
Wind: LICA MASKWA
 Monitor: WSP [kph]
 Monthly: 18/03
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 11.02%

Direction	1.8-2.8	2.8-5.6	5.6-8.4	8.4-11.2	11.2-14.0	>14.0	Total
N	0.1	1.9	1.9	0.4	0.3	0.0	4.6
NE	1.9	7.7	6.6	5.1	0.1	0.0	21.4
E	0.9	3.4	5.2	4.2	1.3	0.0	15.1
SE	1.2	3.4	4.2	1.2	1.3	0.0	11.3
S	0.9	3.5	1.1	0.4	0.0	0.0	5.9
SW	3.5	9.5	6.2	0.5	0.3	0.0	20.0
W	1.3	3.4	1.2	0.1	0.1	0.0	6.2
NW	0.4	1.9	1.1	0.9	0.3	0.0	4.6
Summary	10.3	34.5	27.4	12.9	3.8	0.0	88.9

% Icon Classes (kph)	10	 1.8-2.8	35	 2.8-5.6	27	 5.6-8.4	13	 8.4-11.2	4	 11.2-14.0	0	 >14.0
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LICA MASKWA 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 11.02% Calm Wind Avg Speed: 0.91(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - March 2018

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY 1	ENE	ENE	ENE	ENE	NE	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	NE	24	
2	ENE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	E	ESE	E	ESE	ESE	ESE	E	E	ENE	ENE	ENE	ENE	E	24	
3	ENE	E	E	E	E	E	E	ENE	ENE	E	E	E	E	E	E	E	E	E	E	ESE	ESE	ESE	ESE	ESE	E	24	
4	E	E	E	ESE	ESE	ESE	ESE	E	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	E	ESE	NE	NNE	NE	NE	NE	E	24	
5	NE	NE	NE	NNE	NE	NE	NNE	NNE	NNW	NNW	N	N	N	N	NNW	NW	WNW	W	SW	SW	NNE	NE	SSW	W	N	24	
6	W	W	WNW	W	WSW	W	W	W	WSW	SW	W	WNW	WNW	WNW	WNW	WNW	WNW	WSW	SW	SW	SSW	SW	SW	SW	W	24	
7	SSW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	SW	W	SW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SSW	SW	24	
8	SSW	SW	SW	SSW	SSW	SSE	SW	NE	NNE	NNE	S	SSW	SSE	SSE	S	SSE	SE	SE	SE	SE	SSE	SSE	SE	SE	SSE	24	
9	SE	SE	ESE	ESE	SE	SE	SE	SE	SE	SE	SE	ESE	NNE	WSW	W	WNW	WSW	W	W	WNW	W	WSW	SW	WSW	SSE	24	
10	W	W	WSW	SW	SW	SSW	SSW	SW	SW	SW	SSW	SSW	SW	SSW	SSW	W	SW	SW	SSW	SSW	SSW	SSW	SW	SW	SW	24	
11	SW	SW	ENE	SSW	S	SSE	SSW	SSE	NNE	N	NE	SE	S	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	SSW	24	
12	SW	SW	S	SSW	SSW	SSW	NE	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24	
13	SSW	SW	NE	E	E	SE	SW	NE	NNE	SSW	SW	SSW	SSW	SSE	SE	ENE	ESE	ESE	E	E	ENE	NE	ENE	ENE	SE	24	
14	ENE	ENE	ENE	ENE	ENE	E	NE	ENE	ESE	SE	SE	SE	ESE	ESE	ESE	ESE	ESE	ESE	E	E	E	E	ESE	E	ESE	24	
15	ESE	E	E	ENE	NE	ENE	ENE	E	ESE	SE	ESE	SE	ESE	ESE	ESE	E	ESE	ESE	ESE	ESE	ESE	ESE	SE	ESE	ESE	24	
16	ESE	SE	ESE	SE	ESE	SE	SE	SSE	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSE	SSW	E	SE	S	24	
17	ESE	SSE	SSE	SW	NW	S	ESE	SE	NE	NE	ENE	ESE	ENE	ENE	NE	NE	ENE	SSW	SW	ENE	NE	NE	NE	NE	ENE	24	
18	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	NE	NE	NE	ENE	NE	NE	E	SSE	SE	SE	SE	SSE	ENE	ENE	24	
19	NE	SSE	SSE	NNE	NE	NE	NE	ENE	ESE	SSE	SSE	SSW	SSW	SSW	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	SSW	S	SSW	24	
20	SSW	SSW	SSW	SSW	SSW	SW	SSW	SW	SW	SW	SW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	24
21	SW	ENE	ESE	ENE	ENE	NE	NE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	24
22	NE	ENE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	E	ENE	E	ESE	ESE	E	ESE	ESE	ESE	ESE	ESE	ESE	E	24	
23	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	SSE	SE	SSE	SSE	SSE	S	S	S	S	S	S	NE	NE	SE	24	
24	ENE	ENE	ENE	E	SE	SSE	SSW	SSW	SW	SW	WNW	WNW	WNW	WNW	NW	NNW	NNW	N	N	N	NNE	NNE	N	NNE	NNW	24	
25	NNE	NNE	NNE	NNE	NNE	ENE	NE	ENE	ENE	ENE	SE	SE	S	SSW	SW	WSW	W	NW	SE	ESE	ENE	NE	E	ENE	ENE	24	
26	ENE	ENE	NE	NE	ESE	ENE	SSW	SSW	SW	SSW	SW	WSW	WSW	SW	SW	WNW	NNW	N	N	NNE	NNE	NNE	NNE	NE	N	24	
27	NE	NE	ENE	ENE	E	E	ENE	ENE	E	E	E	E	ESE	ESE	ENE	ENE	NE	NE	NNE	NNE	NNE	SW	SW	WSW	ENE	24	
28	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	WNW	WNW	WNW	NW	N	NNW	NNW	NW	NNW	NNE	ENE	NE	NE	NE	NE	NNW	24	
29	ENE	NE	NE	NE	NE	ENE	ENE	NE	NE	NE	NE	SSW	NW	SSW	SSW	SSW	SSW	SSW	S	S	ENE	NE	E	SSE	24		
30	SE	ESE	NNE	E	NE	ENE	NE	NE	NE	NNE	N	N	N	N	N	NNW	N	NNW	N	NNW	WNW	WNW	NNW	NW	N	24	
31	NW	NW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW	W	W	W	W	W	W	WNW	WNW	24

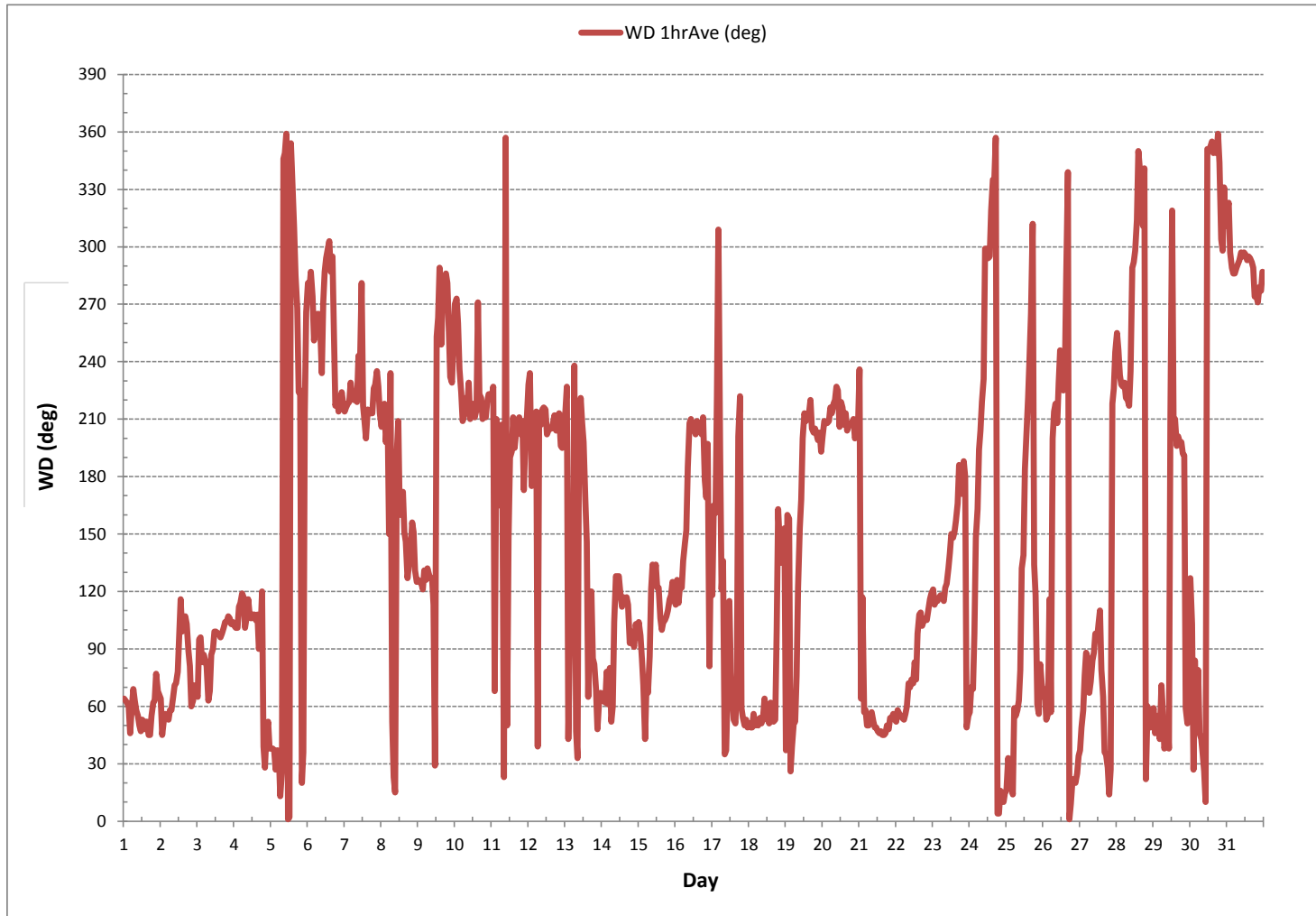
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	December 28, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	90		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	100 (E)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - March 2018

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	
DAY																									
1	15	17	17	18	15	17	17	17	21	23	23	23	26	23	23	23	19	19	22	20	19	21	23	23	24
2	22	17	17	18	19	18	19	22	25	25	26	32	30	32	28	29	27	29	26	26	25	24	24	23	24
3	24	28	30	28	29	27	26	25	24	30	29	29	29	28	29	30	27	29	28	30	30	33	28	27	24
4	28	28	28	30	28	28	26	27	27	33	27	30	29	27	32	30	32	29	26	44	19	21	21	18	24
5	15	16	15	16	15	16	21	22	28	34	33	34	38	41	44	44	36	35	19	49	45	21	45	38	24
6	35	27	30	29	30	25	26	28	33	27	36	38	31	31	28	30	31	31	17	16	14	15	16	15	24
7	17	17	22	17	27	20	11	13	20	42	46	47	29	26	25	22	20	15	15	18	17	18	13	13	24
8	20	43	32	37	67	47	35	45	47	33	47	27	48	35	34	29	30	24	17	19	25	23	23	27	24
9	30	26	28	27	29	25	29	30	28	32	38	40	65	53	42	36	33	28	31	29	24	16	16	22	24
10	24	29	25	18	11	43	21	16	19	23	18	19	20	22	30	35	24	17	12	11	12	15	16	14	24
11	13	12	46	26	19	25	27	13	37	26	28	46	34	30	20	25	22	20	11	18	21	46	53	13	24
12	22	44	29	23	29	18	54	52	38	20	25	25	18	18	20	20	18	17	12	13	20	15	18	20	24
13	18	36	49	51	31	20	54	61	25	32	34	28	36	30	42	32	33	22	23	17	23	15	16	18	24
14	17	19	24	22	16	18	15	24	29	31	35	33	36	33	31	33	28	28	28	26	28	28	27	26	24
15	26	24	25	35	27	28	31	37	31	35	39	32	31	39	34	33	30	24	20	21	21	21	26	24	24
16	24	26	29	29	33	31	36	30	37	23	25	29	27	28	26	21	21	23	11	17	13	57	78	73	24
17	63	52	79	54	56	53	38	57	18	17	41	44	43	36	31	26	33	28	43	32	23	22	24	21	24
18	23	22	23	23	21	23	23	22	22	25	28	35	35	34	33	28	28	30	28	24	30	26	31	25	24
19	50	45	36	16	16	20	28	26	32	42	35	42	25	29	26	28	25	21	18	19	20	20	20	21	24
20	21	21	21	20	26	20	21	21	23	29	27	31	28	28	22	20	18	17	14	14	24	20	39	20	24
21	37	56	20	21	20	21	21	22	24	24	21	22	20	21	20	20	21	20	23	21	23	23	23	23	24
22	21	24	24	24	23	23	23	23	27	27	25	26	34	34	30	28	27	30	27	30	27	27	29	29	24
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24	20	32	28	34	34	30	23	23	24	28	31	45	35	27	32	37	37	33	30	28	21	24	27	23	24
25	19	14	14	17	31	27	22	26	34	45	45	45	59	51	32	37	42	31	25	20	15	18	20	19	24
26	20	20	17	21	46	49	24	23	31	25	31	35	35	32	27	35	37	33	29	20	20	20	20	13	24
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28	21	22	19	11	14	24	14	21	21	29	34	38	28	37	35	38	37	35	32	21	23	22	22	23	24
29	25	18	22	20	13	25	24	14	23	58	61	68	62	57	21	25	23	22	18	13	37	22	48	46	24
30	12	26	41	24	24	20	28	19	21	23	31	36	36	35	36	36	38	34	32	38	28	24	34	28	24
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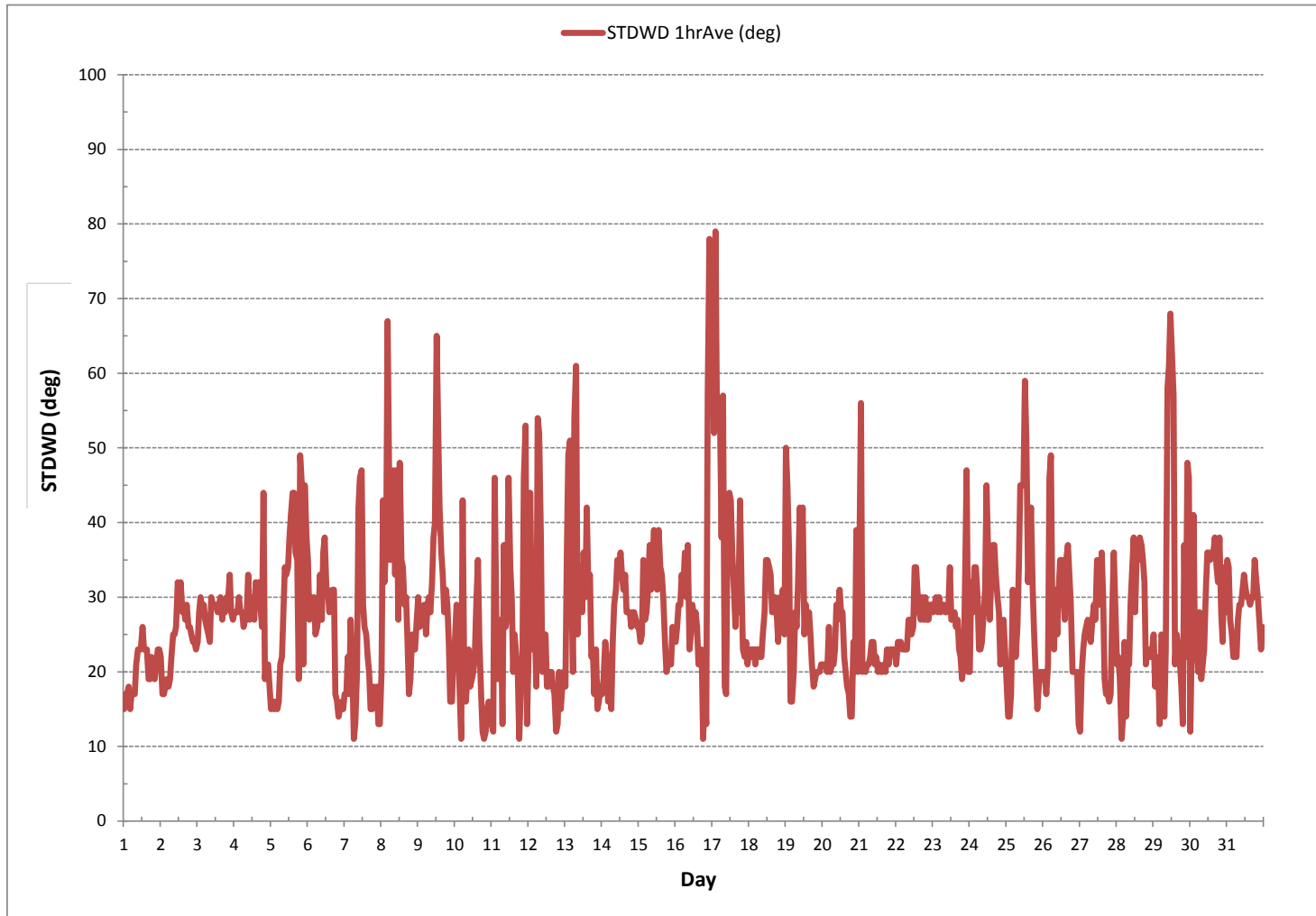
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: December 28, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



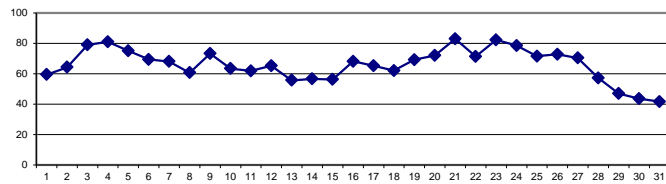
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	77	80	81	80	80	77	77	78	75	69	62	50	40	39	37	35	37	41	43	46	50	53	57	63	35	81	59	24				
2	67	70	74	75	76	76	76	75	72	70	66	63	57	52	51	51	54	56	57	57	60	62	62	63	51	76	64	24				
3	65	70	72	73	72	73	77	80	81	82	82	82	81	81	81	81	82	82	83	82	82	83	84	85	65	85	79	24				
4	85	85	84	84	84	84	83	83	82	81	79	78	78	75	74	77	78	79	81	82	83	82	82	82	74	85	81	24				
5	82	81	81	81	80	81	82	81	79	77	72	65	61	60	61	60	63	72	77	81	81	80	81	83	60	83	75	24				
6	82	83	82	83	83	82	82	80	75	68	57	53	56	52	48	53	48	57	66	71	73	75	78	79	48	83	69	24				
7	77	77	77	77	76	78	80	79	75	68	56	48	49	50	52	51	55	61	66	70	73	76	81	82	48	82	68	24				
8	79	77	76	75	74	73	72	72	72	66	54	49	43	42	41	39	45	53	60	61	53	55	62	63	39	79	61	24				
9	63	64	67	73	73	72	73	73	71	73	73	70	70	69	70	73	73	73	75	76	80	84	85	85	63	85	73	24				
10	85	84	84	83	83	80	81	81	76	65	52	44	40	39	38	35	43	49	55	62	64	64	67	69	35	85	63	24				
11	70	73	79	83	84	85	84	83	77	52	44	38	37	34	34	34	36	41	51	66	72	76	77	73	34	85	62	24				
12	77	80	84	84	83	84	83	82	74	61	52	46	47	45	43	43	45	49	61	70	67	68	68	69	43	84	65	24				
13	71	76	81	83	83	83	83	80	74	60	45	39	32	27	26	26	20	24	37	49	59	59	60	59	20	83	56	24				
14	64	66	68	73	72	75	75	73	59	50	43	39	37	37	36	37	41	48	56	58	60	62	64	65	36	75	57	24				
15	67	70	72	74	76	78	81	77	64	57	51	47	44	41	39	39	38	42	47	47	47	50	50	53	38	81	56	24				
16	58	61	63	66	70	69	66	65	62	63	61	60	62	63	64	65	66	67	74	81	85	85	81	79	58	85	68	24				
17	78	79	79	79	79	80	79	77	71	66	61	56	53	50	50	50	47	59	69	68	62	59	57	59	47	80	65	24				
18	59	61	62	64	66	68	71	73	70	63	62	56	52	52	53	54	55	56	57	61	64	65	69	75	52	75	62	24				
19	76	75	67	70	72	72	69	67	65	64	64	62	61	59	53	59	59	69	73	75	76	77	80	83	53	83	69	24				
20	84	84	83	84	86	86	85	83	81	73	65	58	51	48	50	51	57	61	67	73	74	81	82	83	48	86	72	24				
21	82	82	83	85	85	86	86	87	88	86	85	83	81	79	81	81	80	82	82	82	81	80	81	82	79	88	83	24				
22	83	82	82	82	81	81	80	79	77	75	73	74	71	66	56	53	58	60	63	67	68	68	67	65	53	83	71	24				
23	65	66	66	68	69	72	82	85	86	86	86	86	87	87	87	88	88	88	88	90	90	90	88	85	65	90	82	24				
24	87	88	89	89	90	89	87	82	75	72	76	73	74	76	75	68	70	73	74	76	75	76	75	75	68	90	79	24				
25	77	77	79	80	84	83	81	77	71	67	62	59	57	59	63	60	62	60	70	75	76	78	79	80	57	84	72	24				
26	80	81	82	82	82	81	86	85	84	84	78	60	53	52	53	62	78	72	70	70	67	66	69	70	52	86	73	24				
27	71	72	73	75	73	73	75	75	74	71	66	61	60	59	59	59	66	67	69	72	80	80	79	79	59	80	70	24				
28	79	79	78	77	77	79	79	78	75	64	52	50	50	45	39	33	30	35	39	42	46	48	50	50	30	79	57	24				
29	50	52	54	58	64	69	69	56	43	36	30	27	21	25	31	32	33	37	42	48	54	61	66	68	21	69	47	24				
30	69	67	65	67	64	63	59	52	40	32	26	25	23	23	23	22	24	30	37	41	46	48	49	51	22	69	44	24				
31	54	54	58	59	61	62	60	51	43	35	28	23	23	24	26	26	26	30	35	39	42	44	48	48	23	62	42	24				
HOURLY MAX	87	88	89	89	90	89	87	88	86	86	86	86	87	87	87	88	88	88	88	90	90	90	88	85								
HOURLY AVG	73	74	75	76	77	77	78	76	71	66	60	56	53	52	52	51	53	57	62	66	67	69	70	71								

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

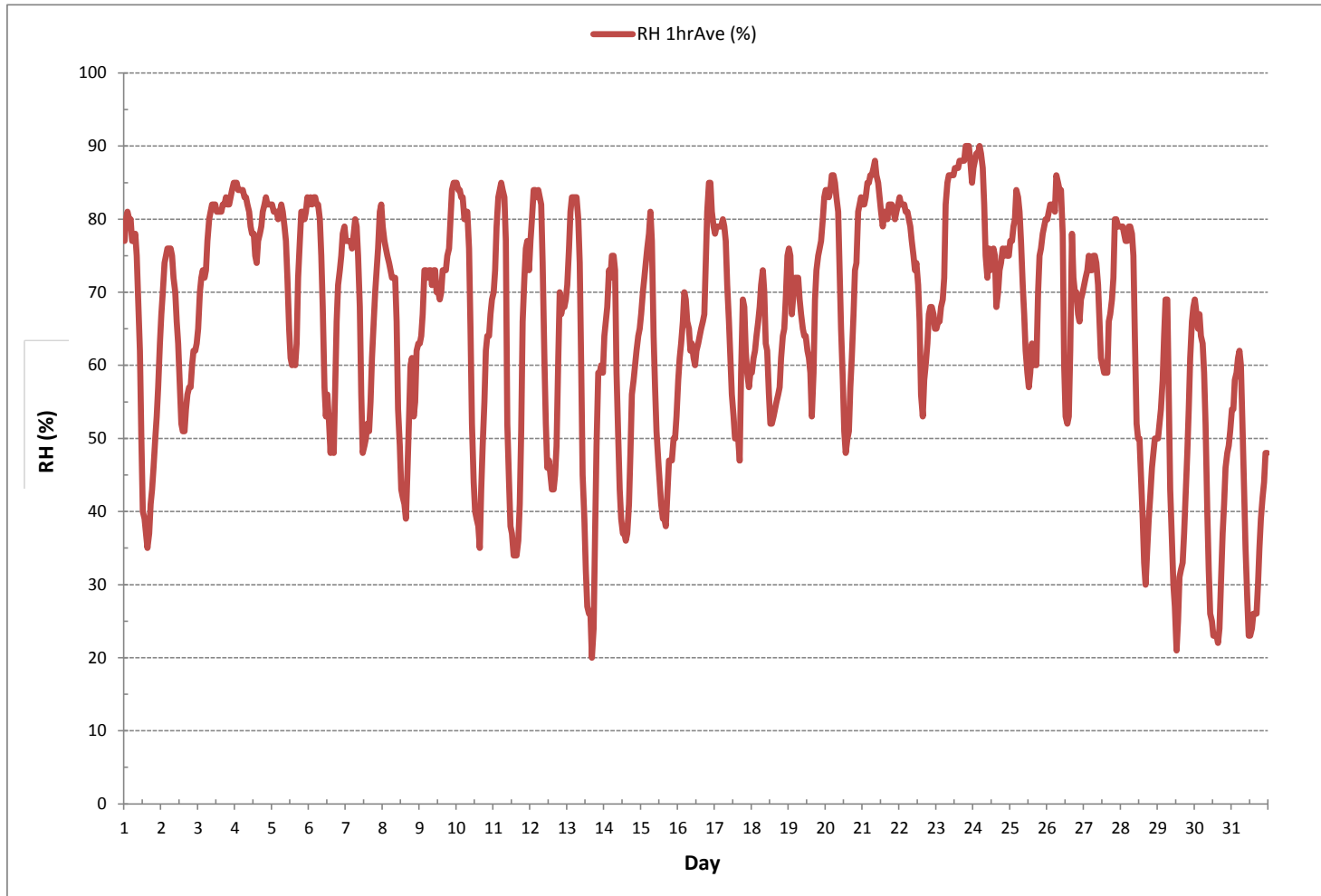
24 HR AVERAGES March 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	20	%	@ HOUR	16	ON DAY	13
MAXIMUM 1-HR AVERAGE:	90	%	@ HOUR	19	ON DAY	23
MAXIMUM 24-HR AVERAGE:	83	%			ON DAY	21
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	16					MONTHLY AVERAGE: 66 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



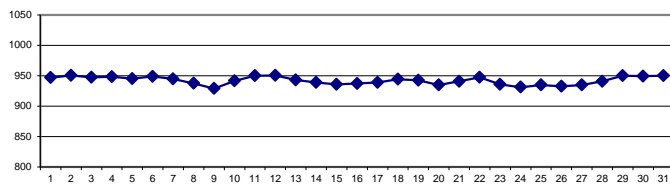
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY																													
1	940	941	941	942	943	944	945	945	946	947	948	948	949	949	949	949	949	949	949	949	950	950	951	951	940	951	947	24	
2	951	952	951	951	951	951	951	951	951	951	951	951	951	951	951	950	950	950	950	950	950	950	950	950	950	950	952	951	24
3	950	949	949	949	948	948	947	947	947	947	947	946	946	946	946	946	946	946	947	947	947	947	947	948	948	946	950	947	24
4	948	948	948	947	947	948	948	948	948	949	949	949	949	949	949	949	949	949	949	949	949	949	949	948	947	949	949	24	
5	948	947	946	946	946	946	945	945	945	944	944	944	944	944	944	944	944	944	944	945	945	945	946	946	944	948	945	24	
6	946	947	947	947	948	948	949	949	949	950	950	951	950	950	950	950	950	949	949	948	948	948	948	948	946	951	949	24	
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10	935	936	937	937	938	939	939	940	940	941	942	942	943	943	943	944	944	944	944	944	944	944	945	945	945	935	945	941	24
11	946	946	946	946	947	947	948	948	949	950	951	952	952	953	953	953	952	952	952	951	951	950	949	948	948	947	947	947	24
12	952	952	952	951	951	951	951	951	951	952	952	952	952	952	951	951	950	949	948	948	947	947	947	947	947	947	953	951	24
13	946	946	945	944	944	943	943	943	943	943	944	944	944	944	944	943	943	943	942	941	941	941	941	941	941	941	946	943	24
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16	936	936	936	936	936	936	936	936	936	937	937	938	938	938	938	938	938	938	938	938	938	938	938	938	938	936	938	937	24
17	938	938	938	938	938	937	937	938	938	938	939	939	939	939	939	939	939	939	939	939	940	940	941	941	941	937	941	939	24
18	941	941	941	942	942	943	943	943	943	944	945	945	946	946	946	946	946	946	946	946	946	946	946	946	946	941	946	944	24
19	946	946	946	945	945	945	944	944	944	944	944	944	943	943	942	941	941	940	940	939	939	938	938	938	938	938	946	942	24
20	937	937	936	935	934	934	934	934	934	934	935	935	935	935	935	935	935	935	935	935	935	935	935	935	934	937	935	24	
21	935	936	936	936	937	937	938	938	938	939	940	941	941	942	942	943	943	944	944	945	946	946	947	947	947	935	947	941	24
22	948	948	948	949	949	949	949	949	949	950	949	949	948	948	948	947	946	945	945	944	944	944	943	943	943	943	950	947	24
23	942	941	940	939	938	938	937	936	936	935	935	935	934	934	934	933	933	934	934	933	934	933	933	933	933	933	942	936	24
24	932	932	931	930	929	929	929	929	929	930	930	931	931	932	932	932	932	932	932	933	933	933	933	933	933	929	933	931	24
25	933	933	934	933	934	934	934	935	935	936	936	936	936	936	935	936	936	936	936	935	936	935	935	934	933	936	935	24	
26	934	933	932	931	931	931	931	931	931	931	931	931	931	931	931	931	931	931	931	931	932	932	932	932	931	937	933	24	
27	937	936	936	935	935	935	934	934	934	933	932	932	932	932	932	933	933	934	935	936	937	938	939	939	932	939	935	24	
28	939	939	939	940	940	940	940	940	940	940	940	940	940	940	940	941	941	941	942	943	944	945	946	946	939	946	941	24	
29	947	947	948	949	950	951	952	952	952	952	952	952	952	952	951	950	950	949	949	949	949	948	948	948	947	952	950	24	
30	948	947	947	946	946	946	947	948	948	948	949	949	949	949	950	950	950	950	951	952	952	953	953	953	946	953	949	24	
31	953	954	954	954	954	954	953	953	953	952	952	952	952	951	950	949	948	947	946	945	945	944	944	944	944	954	950	24	
HOURLY MAX	953	954	954	954	954	954	953	953	953	952	952	952	952	951	950	949	948	947	946	945	945	944	944	944	944	954	954	953	953
HOURLY AVG	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942	942

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

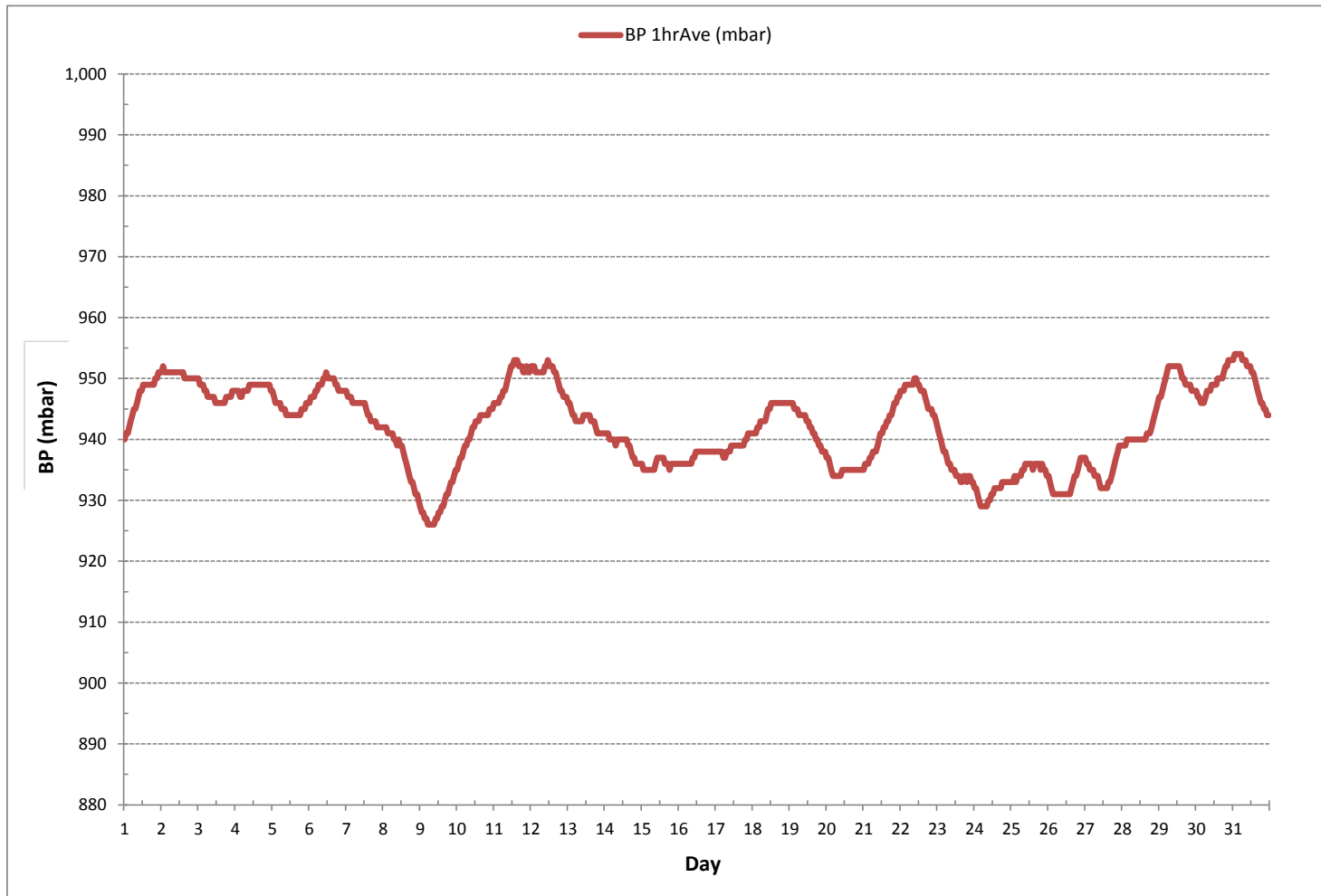
24 HR AVERAGES March 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	926 mbar @ HOUR	5	ON DAY	9
MAXIMUM 1-HR AVERAGE:	954 mbar @ HOUR	1	ON DAY	31
MAXIMUM 24-HR AVERAGE:	951 mbar		ON DAY	2
	OPERATIONAL TIME:			744 hrs
	AMD OPERATION UPTIME:			100.0 %
STANDARD DEVIATION:	7		MONTHLY AVERAGE:	942 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - March 2018

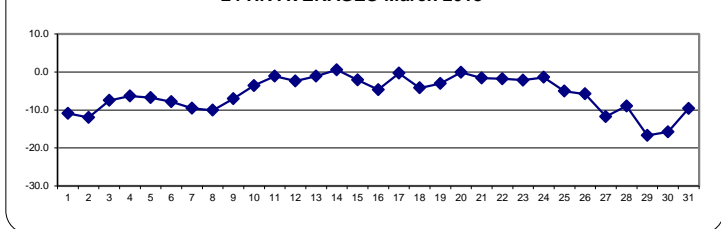
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59				
DAY 1	-11.1	-12.2	-13.3	-13.8	-15.1	-15.2	-16.2	-16.8	-14.9	-12.2	-10.0	-7.7	-5.5	-4.7	-4.4	-4.8	-5.9	-7.4	-8.8	-10.1	-12.0	-12.4	-13.0	-14.2	-16.8	-4.4	-10.9	24
2	-15.1	-16.3	-17.7	-18.3	-19.0	-19.5	-19.6	-19.4	-17.5	-15.0	-11.6	-9.1	-6.0	-4.3	-5.0	-5.5	-6.4	-7.1	-7.6	-7.8	-8.8	-10.0	-10.5	-10.8	-19.6	-4.3	-12.0	24
3	-11.1	-10.2	-10.1	-10.1	-9.9	-9.4	-8.7	-9.0	-9.3	-7.3	-6.8	-6.2	-5.4	-5.3	-5.4	-5.6	-5.7	-5.8	-6.0	-6.3	-6.3	-6.5	-6.7	-6.8	-11.1	-5.3	-7.5	24
4	-6.9	-6.9	-6.9	-6.9	-7.0	-7.1	-7.3	-7.3	-6.8	-6.4	-5.8	-5.5	-5.3	-4.4	-4.2	-5.0	-5.2	-5.5	-5.9	-6.0	-6.3	-6.9	-7.9	-8.8	-8.8	-4.2	-6.3	24
5	-9.4	-9.5	-9.3	-9.1	-8.9	-9.2	-9.2	-9.2	-8.4	-7.6	-6.5	-4.4	-4.1	-3.6	-3.0	-2.6	-3.3	-5.3	-5.9	-6.2	-6.1	-7.2	-7.6	-7.1	-9.5	-2.6	-6.8	24
6	-7.0	-8.1	-7.9	-9.3	-11.0	-11.9	-11.1	-10.6	-9.5	-7.3	-3.6	-1.7	-2.9	-2.6	-1.5	-3.8	-2.5	-6.0	-8.3	-10.2	-11.3	-12.5	-13.8	-14.1	-14.1	-1.5	-7.9	24
7	-13.5	-13.5	-13.3	-13.0	-12.9	-14.4	-15.5	-15.3	-12.7	-9.1	-4.8	-2.7	-2.7	-3.3	-3.3	-2.9	-4.2	-6.6	-8.0	-8.8	-9.6	-11.2	-13.6	-14.4	-15.5	-2.7	-9.6	24
8	-16.2	-17.9	-19.7	-20.0	-20.4	-21.7	-22.7	-22.2	-16.7	-9.4	-4.2	-3.1	-0.1	0.6	0.4	0.7	-1.0	-3.8	-5.9	-6.7	-6.6	-7.4	-9.1	-9.0	-22.7	0.7	-10.1	24
9	-8.7	-8.7	-8.7	-9.1	-9.1	-8.9	-8.9	-8.6	-7.8	-7.4	-6.5	-5.7	-4.8	-4.1	-4.1	-4.7	-4.5	-4.7	-5.1	-5.5	-7.2	-8.4	-8.9	-9.1	-9.1	-4.1	-7.1	24
10	-9.6	-10.5	-10.8	-11.7	-13.1	-15.0	-14.0	-11.4	-9.2	-5.0	0.0	2.6	4.7	5.5	6.8	8.6	5.4	2.8	0.7	-1.3	-2.0	-2.3	-3.4	-4.0	-15.0	8.6	-3.6	24
11	-4.3	-5.2	-8.2	-9.4	-10.3	-10.2	-10.6	-10.1	-5.0	2.1	5.4	8.5	8.8	9.7	9.3	9.2	7.8	5.6	1.4	-2.7	-4.0	-5.1	-5.6	-4.8	-10.6	9.7	-1.2	24
12	-6.1	-7.7	-8.9	-9.8	-10.3	-10.5	-11.3	-10.5	-4.9	0.3	3.1	5.2	5.0	5.5	6.1	5.7	4.8	3.0	-0.6	-3.3	-2.5	-3.2	-3.3	-3.6	-11.3	6.1	-2.4	24
13	-4.1	-5.8	-8.5	-10.1	-11.4	-12.3	-12.4	-11.2	-6.6	-1.3	3.1	5.1	8.3	10.5	11.2	10.9	11.2	8.1	3.1	-0.9	-2.7	-3.1	-3.6	-3.7	-12.4	11.2	-1.1	24
14	-5.0	-4.5	-5.0	-5.6	-5.8	-6.1	-6.1	-5.4	-0.2	3.1	5.2	6.7	7.8	8.4	8.9	8.5	7.0	4.6	1.9	0.8	-0.2	-1.2	-2.0	-2.9	-6.1	8.9	0.5	24
15	-3.8	-4.6	-5.7	-6.8	-7.9	-8.5	-9.3	-7.7	-3.8	-1.7	0.3	1.9	2.8	3.9	4.8	4.9	4.4	2.0	-0.6	-1.2	-1.8	-3.1	-3.9	-5.0	-9.3	4.9	-2.1	24
16	-6.3	-6.7	-7.2	-8.1	-9.2	-8.2	-7.0	-6.3	-4.8	-4.3	-3.2	-2.5	-1.8	-1.2	-0.6	-0.1	-0.5	-1.0	-3.2	-5.3	-6.9	-6.7	-5.8	-5.1	-9.2	-0.1	-4.7	24
17	-4.8	-4.6	-4.4	-4.1	-3.8	-3.9	-3.7	-3.1	-1.5	-0.2	1.7	3.4	4.4	4.3	4.2	3.5	3.7	2.2	0.7	0.4	0.4	-0.5	-1.2	-1.9	-4.8	4.4	-0.4	24
18	-2.4	-3.1	-3.8	-4.8	-5.6	-6.2	-7.4	-8.3	-7.6	-5.8	-5.5	-3.4	-1.6	-1.4	-1.8	-1.9	-1.9	-2.0	-2.2	-2.9	-3.4	-4.3	-6.0	-8.0	-8.3	-1.4	-4.2	24
19	-8.3	-7.8	-5.9	-6.5	-6.9	-7.0	-6.9	-6.0	-4.3	-2.4	-1.4	-0.6	0.4	1.6	2.1	3.1	1.1	-0.7	-2.2	-2.6	-2.1	-2.4	-3.5	-4.4	-8.3	3.1	-3.1	24
20	-4.5	-4.3	-4.3	-4.8	-5.8	-6.1	-5.4	-4.4	-2.0	0.7	3.3	5.8	7.3	7.0	6.9	5.4	4.2	2.9	1.5	1.4	-0.9	-0.7	-1.1	-6.1	7.3	-0.2	24	
21	-1.5	-1.1	-1.7	-2.5	-2.0	-1.5	-1.3	-1.1	-0.7	-0.5	-0.2	-0.1	-0.3	-0.2	-0.7	-0.7	-1.1	-1.7	-2.5	-2.9	-3.1	-3.5	-4.0	-4.4	-4.4	-0.1	-1.6	24
22	-4.7	-4.9	-5.1	-5.6	-6.1	-6.5	-7.0	-6.9	-6.2	-4.9	-3.8	-2.2	-0.2	1.7	5.1	5.4	4.0	3.0	1.9	0.9	0.2	-0.3	-0.8	-0.9	-7.0	5.4	-1.8	24
23	-1.0	-1.2	-1.4	-1.7	-2.1	-2.4	-3.1	-3.2	-3.0	-2.8	-1.9	-1.7	-1.5	-1.0	-0.7	-0.6	-0.4	-0.3	-0.7	-1.9	-2.2	-3.3	-6.0	-8.0	-8.0	-0.3	-2.2	24
24	-6.7	-4.8	-3.6	-2.8	-2.2	-2.8	-3.7	-2.4	-0.6	1.0	0.7	1.5	1.7	1.1	1.4	1.8	1.2	-0.3	-1.1	-1.7	-2.3	-2.9	-3.3	-3.7	-6.7	1.8	-1.4	24
25	-4.2	-5.2	-6.4	-7.7	-9.2	-8.4	-8.6	-8.1	-7.0	-5.9	-4.2	-3.3	-2.2	-1.9	-1.7	-0.8	-1.2	-0.7	-3.2	-4.8	-5.1	-6.3	-7.4	-7.8	-9.2	-0.7	-5.1	24
26	-8.7	-10.3	-12.2	-13.3	-14.6	-14.7	-8.9	-7.6	-6.7	-6.1	-2.9	1.1	3.5	4.3	4.1	3.1	0.1	-1.9	-3.8	-6.1	-7.8	-8.9	-9.9	-10.9	-14.7	4.3	-5.8	24
27	-11.4	-11.6	-11.8	-12.2	-12.7	-13.2	-13.6	-13.6	-13.0	-12.3	-11.0	-8.9	-8.6	-8.2	-8.2	-7.7	-8.8	-9.4	-9.9	-11.9	-14.8	-15.4	-17.5	-16.3	-17.5	-7.7	-11.8	24
28	-16.5	-16.8	-17.6	-18.3	-17.6	-14.2	-13.2	-11.9	-9.2	-6.3	-2.6	-2.0	-2.4	-1.4	-1.3	-0.2	-0.1	-2.0	-4.6	-6.2	-9.2	-12.2	-14.2	-15.3	-18.3	-0.1	-9.0	24
29	-16.4	-17.5	-19.2	-21.1	-23.7	-25.9	-25.7	-21.1	-18.0	-14.7	-11.8	-10.2	-7.6	-8.1	-10.1	-10.1	-10.6	-12.0	-14.0	-16.4	-18.6	-21.4	-23.0	-24.1	-25.9	-7.6	-16.7	24
30	-24.8	-23.8	-24.2	-24.2	-23.6	-23.8	-22.5	-19.7	-16.7	-14.0	-11.3	-9.6	-8.4	-8.2	-8.3	-7.9	-8.7	-10.5	-12.5	-13.7	-15.2	-15.7	-15.7	-16.0	-24.8	-7.9	-15.8	24
31	-16.5	-16.6	-17.0	-17.6	-18.4	-18.6	-18.0	-15.2	-12.0	-8.7	-5.3	-3.1	-1.9	-1.1	-1.6	-1.6	-2.1	-3.7	-5.7	-7.2	-8.4	-9.2	-10.7	-10.9	-18.6	-1.1	-9.6	24
HOURLY MAX	-1.0	-1.1	-1.4	-1.7	-2.0	-1.5	-1.3	-1.1	-0.2	3.1	5.4	8.5	8.8	10.5	11.2	10.9	11.2	8.1	3.1	1.5	1.4	-0.3	-0.7	-0.9				
HOURLY AVG	-8.7	-9.1	-9.7	-10.3	-10.8	-11.1	-11.0	-10.1	-8.0	-5.6	-3.4	-1.8	-0.6	0.0	0.2	0.2	-0.6	-2.0	-3.7	-5.1	-6.0	-6.9	-7.8	-8.3				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

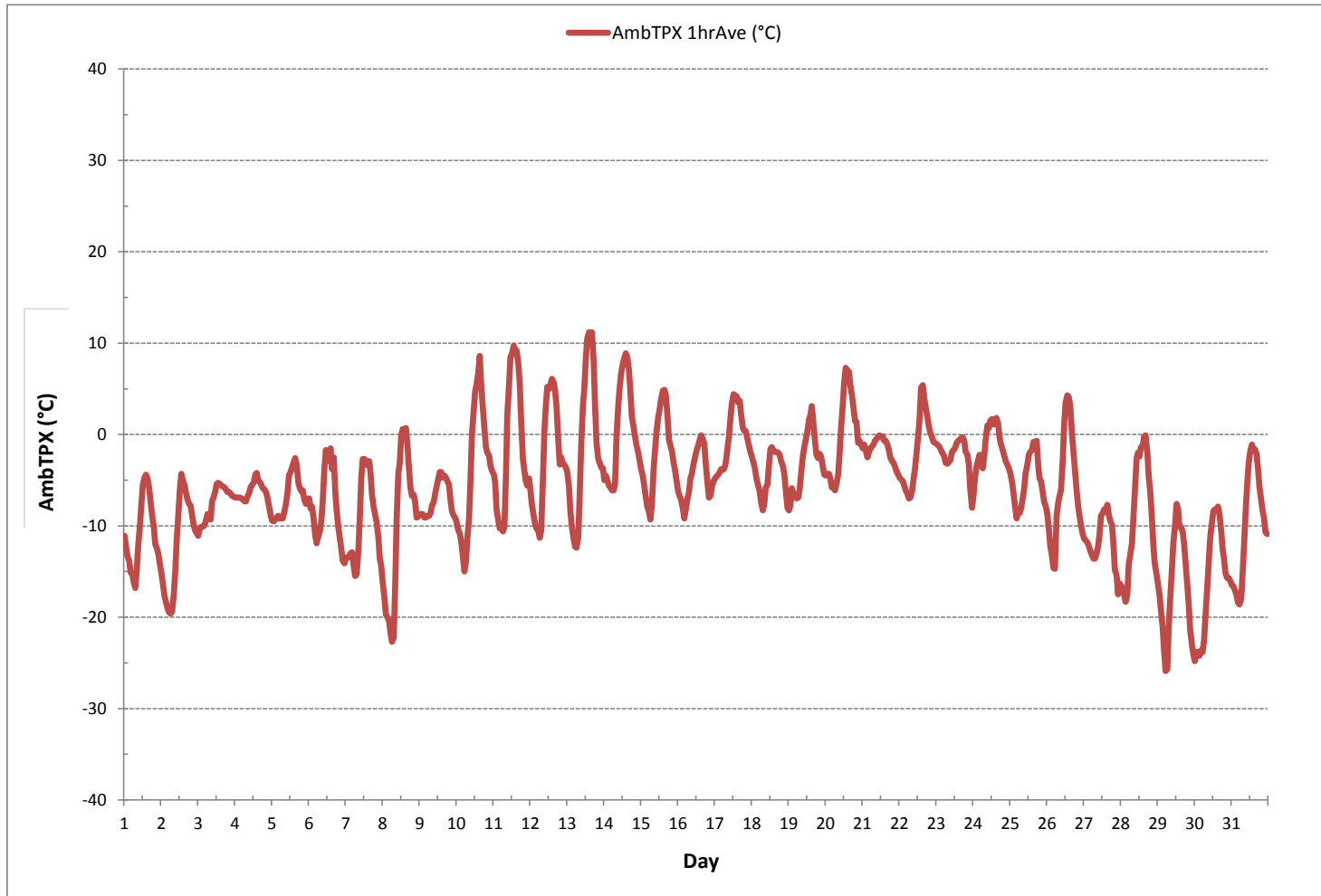
24 HR AVERAGES March 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-25.9 °C	@ HOUR	5	ON DAY	29
MAXIMUM 1-HR AVERAGE:	11.2 °C	@ HOUR	14	ON DAY	13
MAXIMUM 24-HR AVERAGE:	0.5 °C			ON DAY	14
OPERATIONAL TIME:				744	hrs
AMD OPERATION UPTIME:				100.0	%
STANDARD DEVIATION:	6.5	MONTHLY AVERAGE:		-5.8	°C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.1	0.0	0.0	0.3	0.1	24
4	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
5	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.6	0.8	0.8	0.3	1.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.2	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Q	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.1	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	1.1	1.4	1.3	1.0	0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.3	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
27	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	0.0	0.0	0.1	0.0	0.1	0.3	0.8	0.6	1.1	1.4	1.3	1.3	0.5	0.3	0.3	0.2	0.1	0.0	0.0	0.2	0.2	0.0	0.1	0.0				
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				

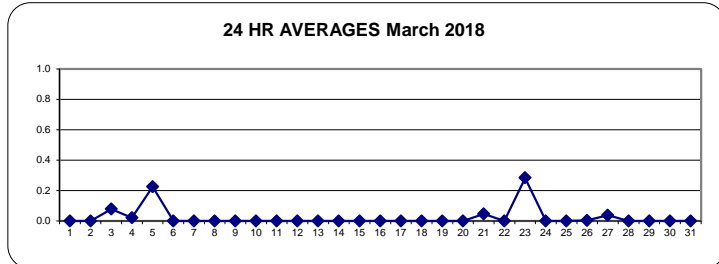
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

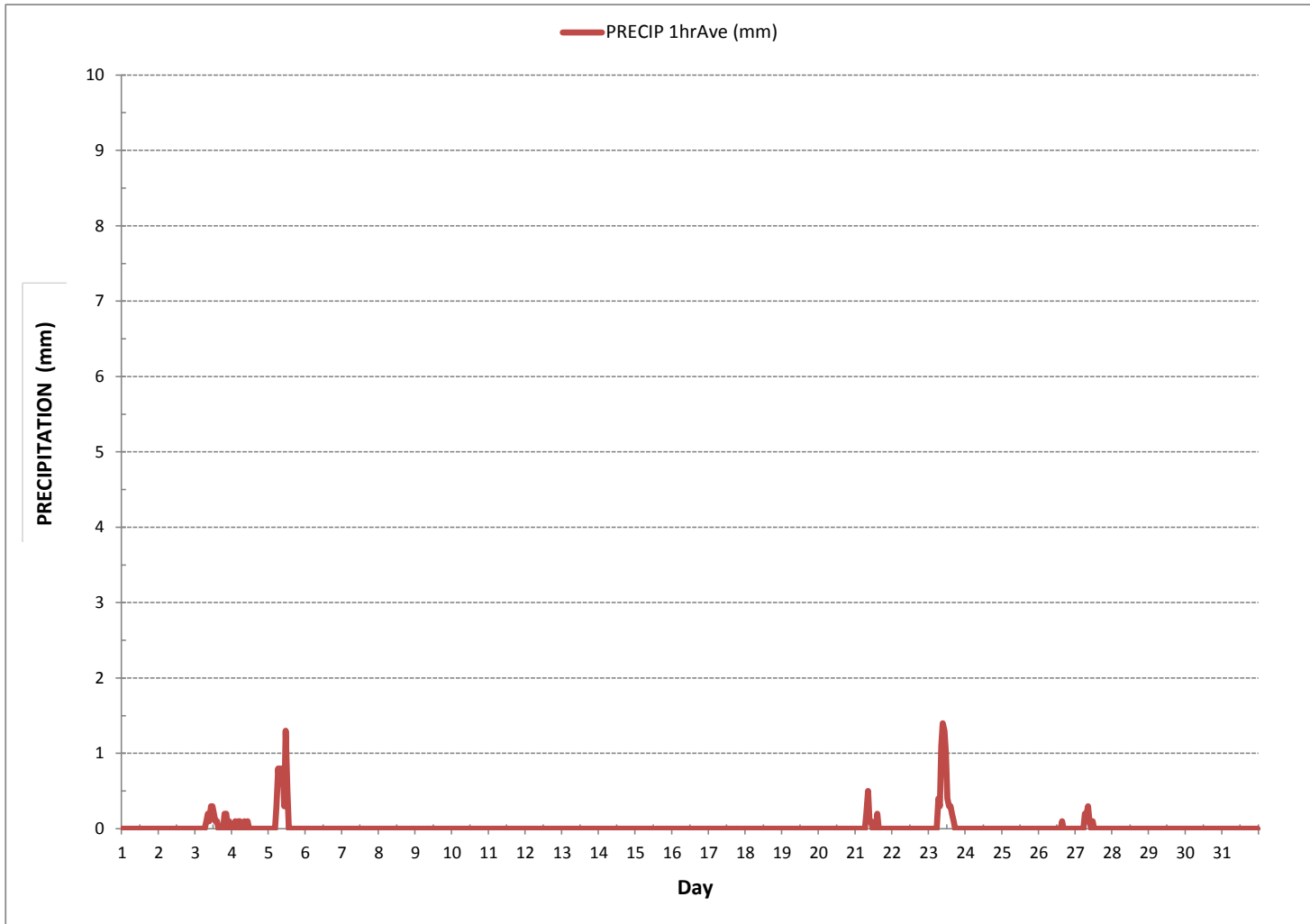
MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	1.4	mm	@ HOUR	9	ON DAY	23
MAXIMUM 24-HR AVERAGE:	0.3	mm			ON DAY	23
MONTHLY TOTAL	16.7	mm				
OPERATIONAL TIME:					744	hrs
AMD OPERATION UPTIME:					100.0	%
STANDARD DEVIATION:	0.1		MONTHLY AVERAGE:		0.0	mm

24 HR AVERAGES March 2018



PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: <u>March 16, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u>	<u>937</u>	<u>millibars</u>
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	<u>°C</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Cloudy/Overcast</u>		
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>10:32</u>	Performed By/Reviewer: <u>Alex Yakupov</u>		<u>Rob Fisher</u>
End Time 24 hr. (mst): <u>15:07</u>	Cal Gas Expiry Date: <u>October 24, 2020</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>		

Analyzer:	Range ppb: <u>1000</u>
ID# or Serial Number: <u>508</u>	As Found C.F.: <u>0.987</u>
Last Calibration Date: <u>February 8, 2018</u>	New C.F.: <u>1.000</u>
Previous C.F.: <u>0.999</u>	

Calibration Standards:	Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u>	<table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								
High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u>									
Calibrator ID/Expiry Date: <u>Environics id# 5212 expires March 01, 2019</u>									
Cal Gas Cylinder I.D. #: <u>LL 104225</u>									
Cal Gas Conc. (ppm): <u>49.2</u>									

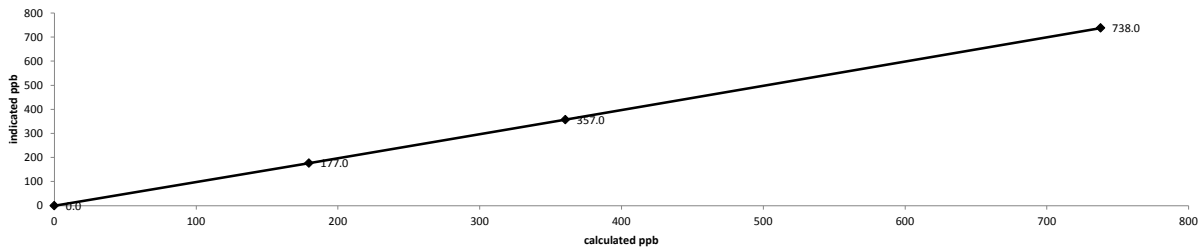
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	5056	0.00	5056	0.0	3.0	n/a
as found high	4970	75.69	5046	738.0	751.0	0.987
adjusted zero	5056	0.00	5056	0.0	0.0	n/a
adjusted high	4970	75.69	5046	738.0	738.0	1.000
mid	4996	36.87	5033	360.4	357.0	1.010
low	5022	18.40	5040	179.6	177.0	1.015
calibrator zero	5056	0.00	5056	0.0	0.0	n/a
Average C.F. =						1.008

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient = <u>1.000</u>	> or = 0.995
Slope = <u>0.999</u>	0.95-1.05
b (Intercept as % of full scale) = <u>0.18%</u>	± 3% F.S.
% change in C.F. from last cal = <u>1.24%</u>	± 10%

API 100E Sulphur Dioxide Analyzer Calibration



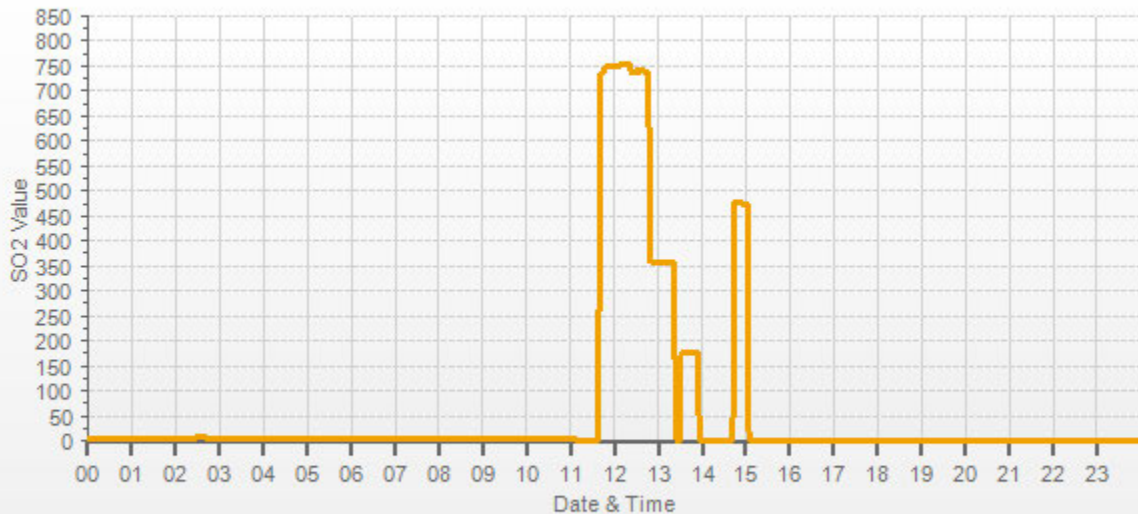
	As found:		As left:
Slope:	<u>0.953</u>	Slope:	<u>0.938</u>
Offset:	<u>164.2</u>	Offset:	<u>170.3</u>
Hvps:	<u>483</u>	Hvps:	<u>483</u>
Rcell Temp:	<u>50.0</u>	Rcell Temp:	<u>50.0</u>
Box Temp:	<u>30.3</u>	Box Temp:	<u>30.3</u>
Pmt Temp:	<u>7.6</u>	Pmt Temp:	<u>7.6</u>
Izs Temp:	<u>50.0</u>	Izs Temp:	<u>50.0</u>
Pres:	<u>24.6</u>	Pres:	<u>24.6</u>
Samp Fl:	<u>579</u>	Samp Fl:	<u>579</u>
Norm Pmt:	<u>170.0</u>	Norm Pmt:	<u>169.8</u>
Uv Lamp:	<u>2329.2</u>	Uv Lamp:	<u>2329.0</u>
Lamp Ratio:	<u>85.2</u>	Lamp Ratio:	<u>85.1</u>
Str Lgt:	<u>78.3</u>	Str Lgt:	<u>79.9</u>
Drk Pmt:	<u>10.3</u>	Drk Pmt:	<u>10.7</u>
Expected Value:	<u>466.0</u>	Expected Value:	<u>475.0</u>

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

SO2[ppb] Station: LICA MASKWA Daily: 18/03/16 Type: AVG 1 Min. [1 Min.]



— SO2[ppb]

HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date: <u>March 16, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u>	<u>937</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Cloudy/Overcast</u>		
Parameter: <u>Hydrogen Sulphide</u>	Calibration Purpose: <u>routine monthly</u>		
Start Time 24 hr. (mst): <u>10:32</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Rob Fisher</u>	
End Time 24 hr. (mst): <u>15:07</u>	Cal Gas Expiry Date: <u>June 14, 2019</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>		

Analyzer:	ID# or Serial Number: <u>510</u>	Range ppb: <u>100</u>	
	Last Calibration Date: <u>February 9, 2018</u>	As Found C.F.: <u>1.012</u>	
	Previous C.F.: <u>1.000</u>	New C.F.: <u>1.000</u>	

Calibration Standards:	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):								
Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>78</td></tr> <tr><td>Mid</td><td>38</td></tr> <tr><td>Low</td><td>19</td></tr> </table>	Point	ppb	High	78	Mid	38	Low	19	Start/End Time 24 hr.: <u>11:27 / 11:37</u>
Point	ppb									
High	78									
Mid	38									
Low	19									
High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u>		SO2 Analyzer Range: <u>1000</u>								
Calibrator ID/Expiry Date: <u>Enviroics id# 4760 expires March 02, 2019</u>		Target Concentration (ppb): <u>780</u>								
Cal Gas Cylinder I.D. #: <u>EY 0000654</u>		As Found Zero: <u>0.0</u>								
Cal Gas Conc. (ppm): <u>10.2</u>		Analyzer Response: (ppb): <u>0.0</u>								
		Zero Corrected Result (ppb): <u>0.0</u>								

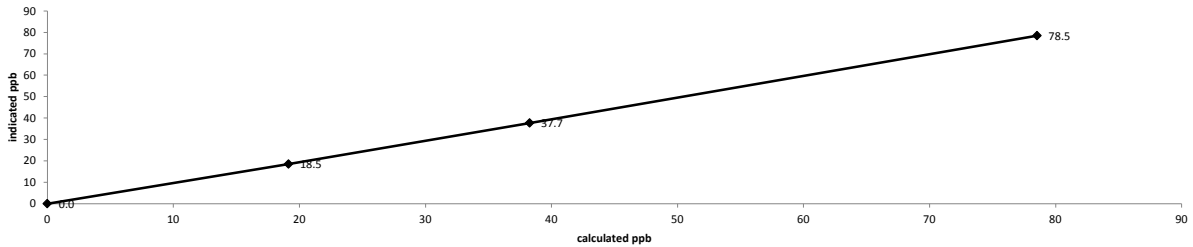
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7438	0.00	7438	0.0	0.3	n/a
as found high	7383	57.28	7440	78.5	77.9	1.012
adjusted zero	7438	0.00	7438	0.0	0.0	n/a
adjusted high	7383	57.28	7440	78.5	78.5	1.000
mid	7408	27.90	7436	38.3	37.7	1.015
low	7438	13.98	7452	19.1	18.5	1.034
calibrator zero	7438	0.00	7438	0.0	0.0	n/a
Average C.F. =						1.017

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient = <u>1.000</u>	> or = 0.995
Slope = <u>0.998</u>	0.95-1.05
b (Intercept as % of full scale) = <u>0.37%</u>	± 3% F.S.
% change in C.F. from last cal = <u>-1.20%</u>	± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



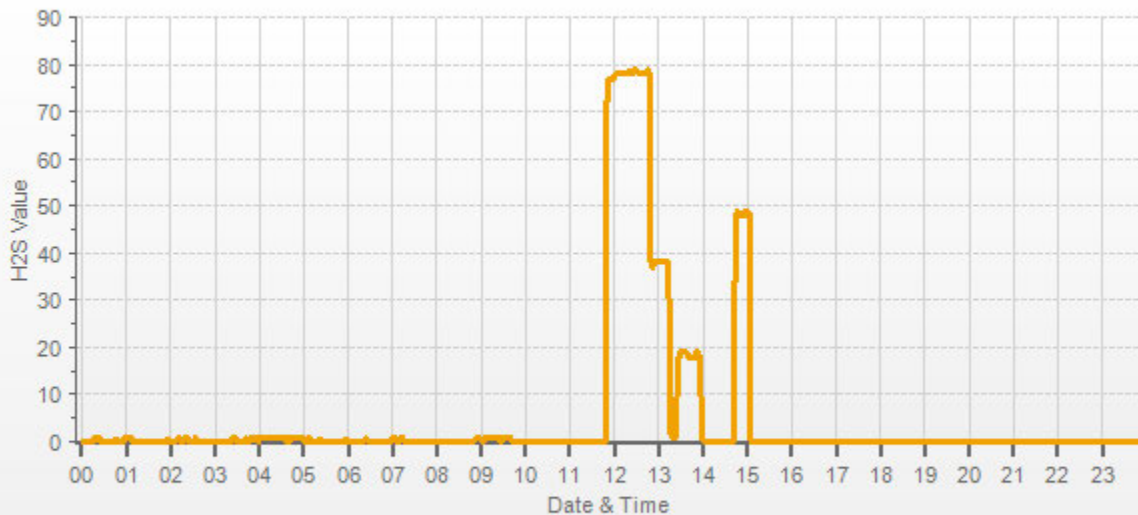
<p style="text-align: center;">As found:</p> Slope: <u>0.970</u> Offset: <u>33.6</u> Hvps: <u>530</u> Rcell Temp: <u>50.0</u> Box Temp: <u>34.6</u> Pmt Temp: <u>8.4</u> Izs Temp: <u>45.0</u> Converter Temp: <u>314.8</u> Pres: <u>20.1</u> Samp Fl: <u>526</u> Uv Lamp: <u>2842.8</u> Lamp Ratio: <u>84.8</u> Str Lgt: <u>16.3</u> Drk Pmt: <u>32.7</u> Expected Value: <u>47.3</u>	<p style="text-align: center;">As left:</p> Slope: <u>0.978</u> Offset: <u>34.4</u> Hvps: <u>530</u> Rcell Temp: <u>50.0</u> Box Temp: <u>34.7</u> Pmt Temp: <u>8.4</u> Izs Temp: <u>45.0</u> Converter Temp: <u>314.7</u> Pres: <u>20.1</u> Samp Fl: <u>526</u> Uv Lamp: <u>2843.4</u> Lamp Ratio: <u>84.7</u> Str Lgt: <u>16.8</u> Drk Pmt: <u>32.8</u> Expected Value: <u>48.5</u>
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Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

H2S[ppb] Station: LICA MASKWA Daily: 18/03/16 Type: AVG 1 Min. [1 Min.]



— H2S[ppb]

TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Total Hydrocarbon Analyzer Calibration

Date:	March 16, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	937	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	Maskwa	Weather Conditions:	Cloudy/Overcast		
Parameter:	Total Hydrocarbon	Calibration Purpose:	routine monthly		
Start/End Time 24 hr. (mst):	14:24 / 18:22	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 24, 2022		

Analyzer:	ID# or Serial Number:	436609738	Range ppm:	50
	Last Calibration Date:	February 9, 2018	As Found C.F.:	1.050
	Previous Cal High Point C.F.:	1.000	New C.F.:	0.999

Calibration Standards:	Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
	Calibrator ID/Expiry Date:	Environics id# 4760 expires March 02, 2019	Cal Gas Cylinder I.D. #:	LL 165367
	CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	590.0	207.0	
	CH ₄ as propane/total CH ₄ equivalents (ppm):	569.3	1159.3	

Standard Calibration Points for a Range of:		50 ppm
Point		Target ppm
High		38
Mid		18
Low		9

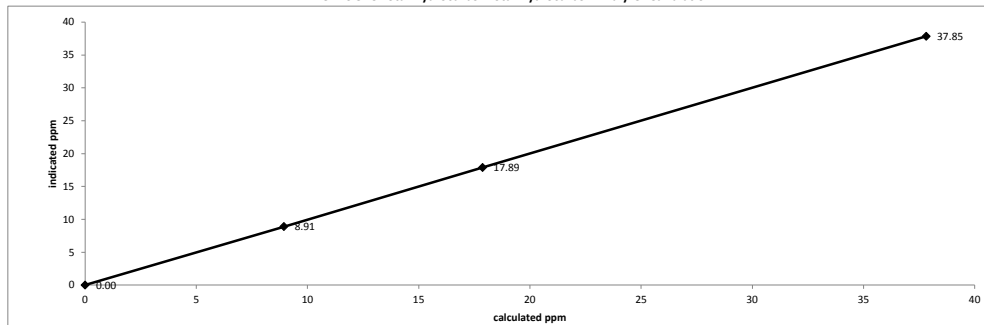
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Diluent	Cal Gas	Total	Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors:
as found zero	2507	0.00	2507	0.0	-0.07	n/a
as found high	2426	81.82	2508	37.82	35.94	1.050
adjusted zero	2507	0.00	2507	0.00	0.00	n/a
adjusted high	2426	81.82	2508	37.82	37.85	0.999
mid	2467	38.64	2506	17.87	17.89	0.999
low	2488	19.33	2507	8.94	8.91	1.003
calibrator zero	2507	0.00	2507	0.0	0.00	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS
Slope =	0.999	> or = 0.995
b (Intercept as % of full scale) =	0.03%	0.95-1.05
% change in C.F. from last cal =	-5.02%	± 3% F.S.
		± 10%

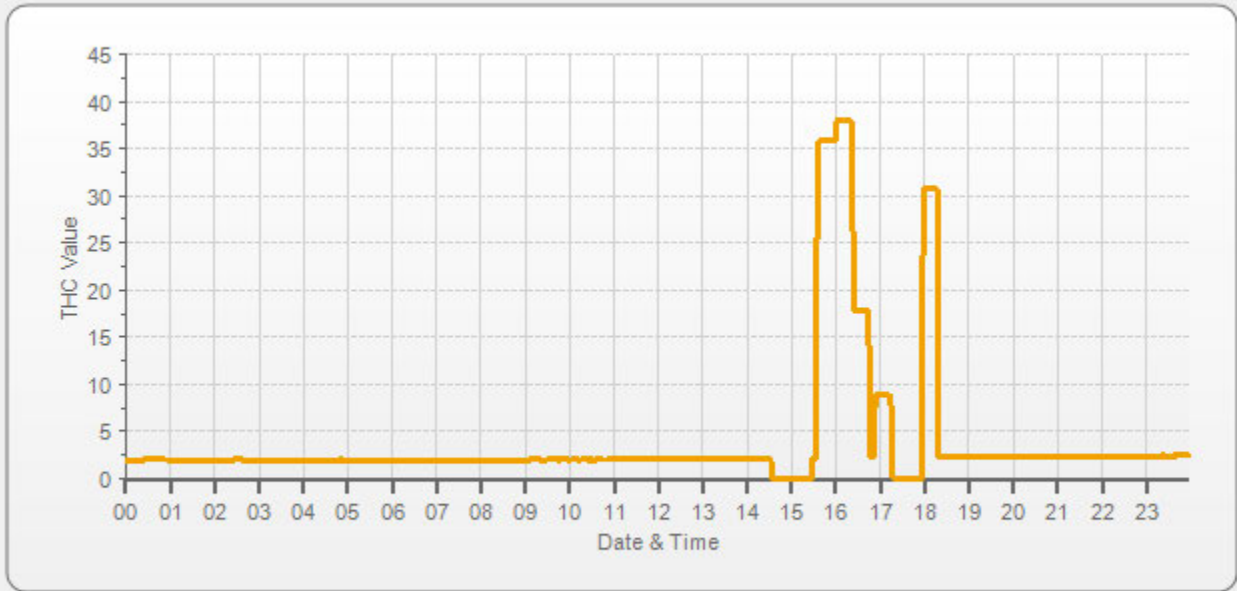
Thermo 51C Total Hydrocarbon Total Hydrocarbon Analyzer Calibration



H2 cylinder (psi):	1800	H2 cylinder (psi):	1800
H2 cylinder reg set (psi):	22	H2 cylinder reg set (psi):	22
Span Cylinder (psi):	750	Span Cylinder (psi):	750
Span Cylinder Reg Set (psi):	22	Span Cylinder Reg Set (psi):	22
Zero Air Gen Pressure:	39	Zero Air Gen Pressure:	39
measurement alarms:	None	measurement alarms:	None
service alarms:	None	service alarms:	None
cnt:	1351	cnt:	1931
rng:	1	rng:	1
try:	2	try:	2
flm:	203.0	flm:	203.1
det:	125.7	det:	125.7
Flame:	203	Flame:	203
Filter:	125	Filter:	125
Base:	125	Base:	125
Sample psi:	07.50	Sample psi:	07.50
Internal Air Pressure:	20	Internal Air Pressure:	20
Internal Fuel Pressure:	13	Internal Fuel Pressure:	13
Measured Flow:	0.978	Measured Flow:	n/a
Expected Value:	30.80	Expected Value:	30.70

Comments: The analyzer sample inlet filter was changed.

The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.



— THC[ppm]

NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date: <u>March 16, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u> <u>937</u> <u>millibars</u>
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u> <u>22</u> <u>°C</u>
Location/Station Name: <u>Maskwa</u>	Weather Conditions: <u>Cloudy/Overcast</u>
Start/End Time 24 hr. (mst): <u>10:32 / 18:41</u>	Calibration Purpose: <u>routine monthly</u>
G.P.T. to be used for Ozone? <u>No</u>	Performed By/Reviewer: <u>Alex Yakupov</u> <u>Rob Fisher</u>
Calibration Method: <u>Gas Dilution & Gas Phase Titration</u>	Cal Gas Expiry Date: <u>October 24, 2020</u>

Analyzer:		Correction Factors:		
ID# or Serial Number: <u>2051</u>	NO =	Previous C.F.:	As Found C.F.:	New C.F.:
Last Calibration Date: <u>February 8, 2018</u>	NO ₂ =	0.999	1.005	0.999
Range ppb: <u>1000</u>	NOx =	1.000	1.000	1.000
		1.000	1.004	1.000

Calibration Standards:			
Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u>	Standard Calibration Points for a Range of: <u>1000 ppb</u>		
High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u>	Point	Target NO (ppb)	Target NO ₂ (ppb)
Calibrator ID/Expiry Date: <u>Enviroconics id# 5212 expires March 02, 2019</u>	High	780	500
Cal Gas Cylinder I.D. #: <u>LL 104225</u>	Mid	380	275
Cal Gas Conc. (ppm): <u>51.5</u> <u>51.6</u>	Low	190	100
	Extra Point #1	n/a	n/a
	Extra Point #2	n/a	n/a
			Cc Ozone ?
			n/a
			n/a
			n/a

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
as found zero	5056	0.0	5056	0	0	1.0	1.0	n/a	n/a
as found high	4970	75.7	5046	772.5	774.0	770.0	772.0	1.005	1.004
adjusted zero	5056	0.00	5056	0.0	0.0	0.0	0.0	n/a	n/a
adjusted high	4970	75.69	5046	772.5	774.0	773.0	774.0	0.999	1.000
mid	4996	36.87	5033	377.3	378.0	370.0	371.0	1.020	1.019
low	5022	18.40	5040	188.0	188.4	182.0	183.0	1.033	1.029
calibrator zero	5056	0.00	5056	0	0	0.0	0.0	n/a	n/a
Average C.F.=								1.017	1.016

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4970	75.69	5046	0.0	774.0	775.0	1.0	0.0	1.0	
as found high NO2	4970	75.69	5046	500.0	291.0	775.0	484.0	483.0	483.0	1.000
adjusted high NO2	4970	75.69	5046	500.0	291.0	775.0	484.0	483.0	483.0	1.000
gpt mid	4970	75.69	5046	285.0	495.0	775.0	280.0	279.0	279.0	1.000
gpt low	4970	75.69	5046	100.0	676.0	775.0	99.0	98.0	98.0	1.000
Average NO ₂ C.F.=									1.000	

Linear Regression/Calibration Results:

	NO	NOx	NO ₂	LIMITS
Correlation Coefficient =	1.000	1.000	1.000	> or = 0.995
Slope =	0.997	0.998	1.002	0.95-1.05
b (Intercept as % of full scale)=	-0.40%	-0.36%	0.06%	± 3% F.S.
% change in C.F. from last cal=	-0.56%	-0.39%	0.00%	± 10%
NO ₂ converter efficiency	n/a	n/a	0.99	0.96 to 1.04

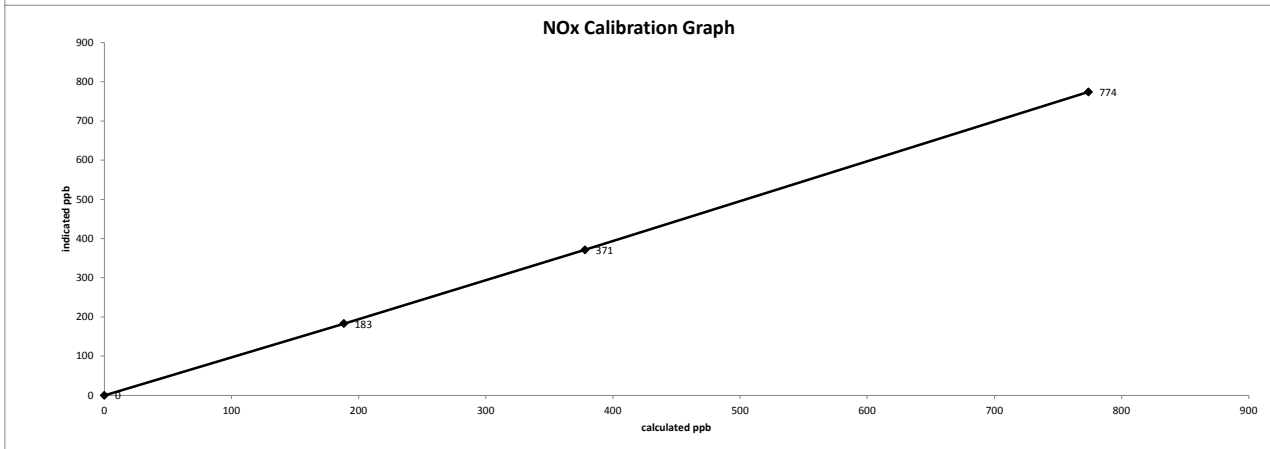
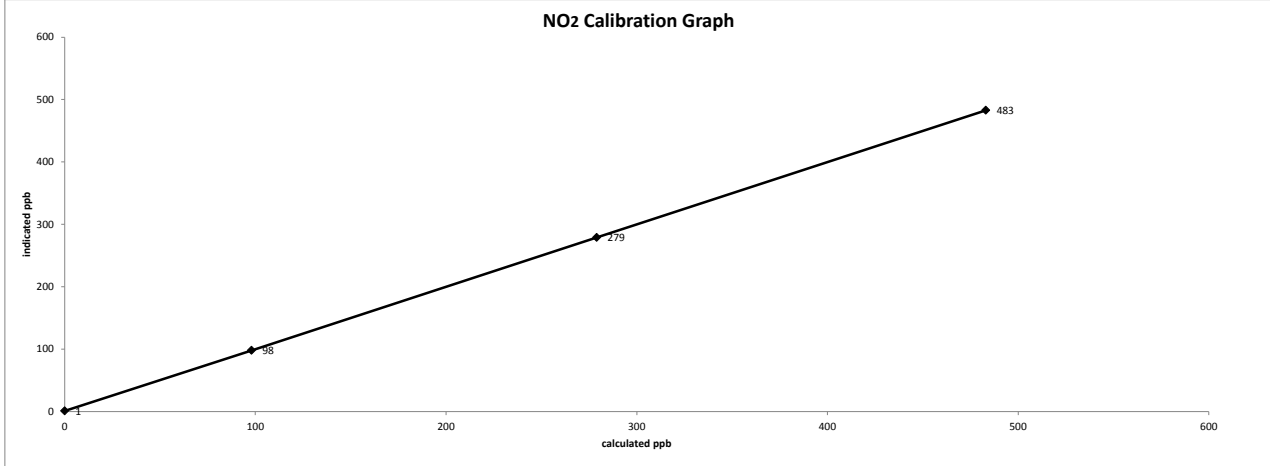
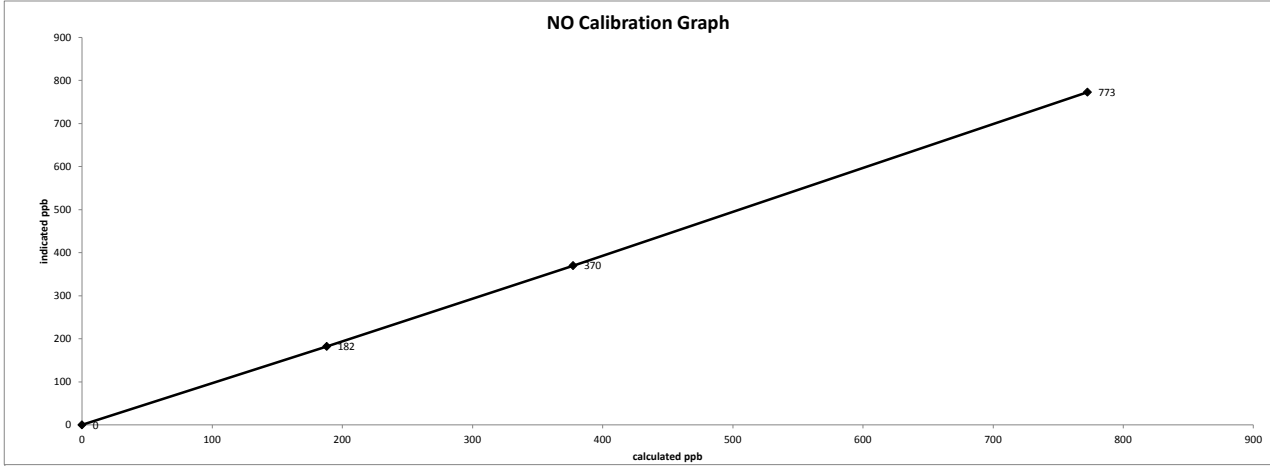
As found:		As left:	
NOx SLOPE:	1.029	NOx SLOPE:	1.031
NOx OFFS:	-3.5	NOx OFFS:	-2.2
NO SLOPE:	1.030	NO SLOPE:	1.031
NO OFFS:	-4.0	NO OFFS:	-2.8
SAMP FLW:	500	SAMP FLW:	500
OZONE FL:	81	OZONE FL:	81
NORM PMT:	-2.9	NORM PMT:	-3.1
AZERO:	45.4	AZERO:	45.6
HVPS:	707	HVPS:	707
DCPS:	2578	DCPS:	2570
RCCELL:	50.3	RCCELL:	50.3
BOX TEMP:	28.4	BOX TEMP:	28.6
IZS TEMP:	43.3	IZS TEMP:	43.0
MOLY TEMP:	314.3	MOLY TEMP:	314.9
RCEL:	6.9	RCEL:	6.9
SAMP:	29.6	SAMP:	29.7
Expected Value NO:	7	Expected Value NO:	6
Expected Value NO ₂ :	367	Expected Value NO ₂ :	368
Expected Value NOx:	374	Expected Value NOx:	374

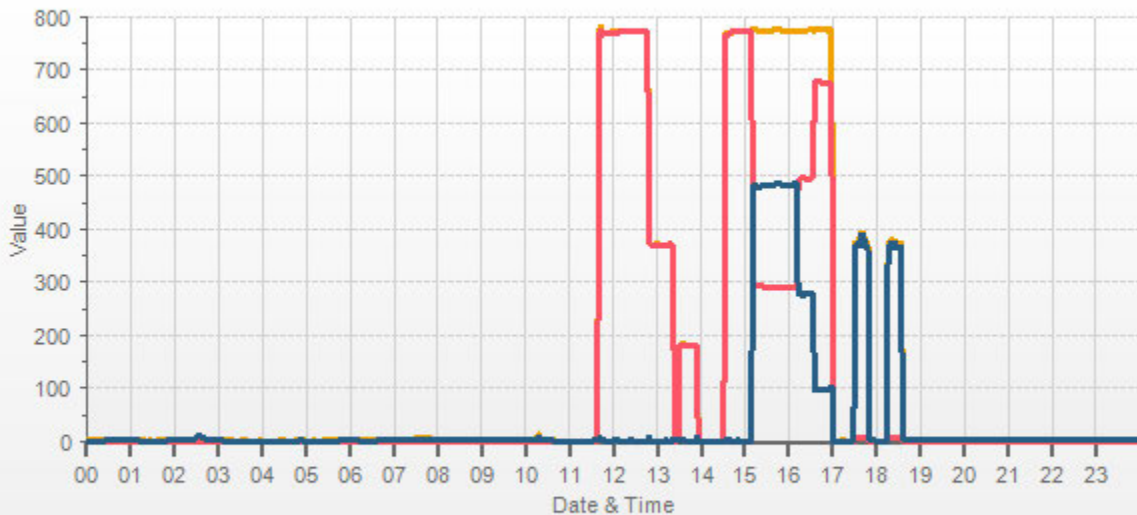
Comments:
 The analyzer sample inlet filter was changed.
 The manifold blower was found to be working normally.
 The analyzer cooling fan filter(s) were cleaned.

Date: March 16, 2018
Company/Airshed: LICA
Location/Station Name: Maskwa

Start/End Time 24 hr. (mst): 10:32 / 17:54
Calibration Purpose: routine monthly
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration





— NOx [ppb] — NO [ppb] — NO2 [ppb]

WIND SYSTEM



Meteorological Sensor Audit/Calibration

Location Information

Company:	LICA	Performed By:	Alex Yakupov
Audit Location:	Maskwa	Reviewed By:	Rob Fisher
Audit Date:	December 28, 2017	Start/End Time (mst):	14:16 / 18:15
Calibration Purpose:	installation	Weather Conditions:	Mix of sun and clouds

Wind Sensor Information

Sensor ID Data:		Sensor Outputs:	
Sensor Make:	RM Young	Velocity Voltage Output Range:	0-1 V
Sensor Model:	05305VK	Velocity Unit Output Range:	0-200 km/h
Serial #:	92411	Direction Voltage Output Range:	0-1 V
Previous Cal/Audit Date:	October 23, 2017	Direction Unit Output Range:	0-360 degrees

Wind Calibrator Information

Calibrator I.D. and Expiry Date: RM Young 18802 id# CA03309 expires September 25, 2018

Wind Speed Audit Data ****+/- 2% of the average correction factor is the limit****

RPM	Wind Speed Generated kph	Clockwise Wind Speed kph	Counter Clockwise Wind Speed kph	Correction Factor
0	0	0.0	0.0	-
1000	18.4	18.5	18.5	0.996
2000	36.9	36.9	36.9	1.000
3000	55.3	55.4	55.4	0.999
4000	73.7	73.9	73.8	0.998
5000	92.2	92.3	92.3	0.999
6000	110.6	110.7	110.7	0.999
7000	129.0	129.1	129.1	0.999
8000	147.4	147.6	147.6	0.999
9000	165.9	166.0	166.0	0.999
10000	184.3	184.4	184.4	0.999
The audit meets AMD requirements.			Average Correction Factor=	0.999

Wind Direction Audit Data ****+/- 3° of the absolute average degrees difference for all points is the limit****

Generated Wind Direction 0-360 (Up)	Generated Wind Direction 360-0 (Down)	Indicated Wind Direction 0-360 (Up)	Indicated Wind Direction 360-0 (Down)	Degrees Difference 0-360 (Up)	Degrees Difference 360-0 (Down)	Average Absolute Degrees Difference
0	355	0	356	0.0	-0.8	0.4
30	330	32	332	-1.6	-1.8	1.7
60	300	62	302	-2.0	-2.2	2.1
90	270	91	272	-1.4	-1.7	1.6
120	240	121	242	-1.3	-1.5	1.4
150	210	151	212	-1.2	-2.0	1.6
180	180	181	181	-1.4	-1.0	1.2
210	150	212	151	-2.4	-0.7	1.6
240	120	242	121	-2.2	-1.2	1.7
270	90	272	91	-2.4	-1.1	1.7
300	60	302	61	-2.0	-1.4	1.7
330	30	332	31	-2.0	-1.1	1.6
355	0	356	0	-0.8	0.4	0.6
The audit meets AMD requirements.			Average Absolute Degrees Difference=		1.4	

Comments:

The Sonic Wind System was removed due high unrealistic mesurements. The RM Young Wind System was installed.

CALIBRATORS

Company: Maxxam Operator: Chris W

Calibrator:			Flow Measurement Device:		
Make/Model	<u>Envionics 6100</u>		Make/Model	<u>Mesa Defender 530</u>	
Serial Number	<u>5212</u>		Serial Number	<u>L-153351 H-152571</u>	
Last Verification Date	<u>February 2017</u>		Temperature (°C)	<u>24.0 C</u>	
NO Cylinder S/N	<u>EY0000715</u>		Barometric Pressure	<u>702 mmHg</u>	
NO [PPM]	<u>50.7</u>	NOx [PPM] <u>50.8</u>			
Expiry Date	<u>May 2021</u>				

Dilution Flow (sccm)					
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>	Pt. #3	<u>5000</u>
Gas Flow (sccm)					
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>	Pt. #3	<u>20</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
5004	77.2	0.7822	0.7837	0.7769	0.0006	0.7774	-1%	-1%
5018	37.7	0.3809	0.3817	0.3777	0.0005	0.3782	-1%	-1%
5012	18.8	0.1902	0.1905	0.1884	-0.0002	0.1885	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9934	0.90-1.10		m (Slope)=	0.9921
b (Intercept % of FS)=	-0.0332	± 3% F.S.		b (Intercept % of FS)=	-0.0277

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
5004	0.000	0.0000	0.7766	0.0007	0.7773	NO ₂	% Diff. Limit
5004	0.500	0.4846	0.2920	0.4797	0.7717	-1%	± 10%
5004	0.280	0.2731	0.5035	0.2713	0.7747	-1%	± 10%
5004	0.100	0.0958	0.6808	0.0962	0.7770	0%	± 10%
Absolute Average Percent Difference						1%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO ₂		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9880	0.90-1.10	
b (Intercept % of FS)=	0.1153	± 3% F.S.	

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 1, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark Date: March 1, 2018
 Operator Signature: [Signature] Location: McIntyre Center Edmonton

Company: Maxxam Operator: Chris W

Calibrator:				Flow Measurement Device:			
Make/Model	<u>Envronics 6100</u>			Make/Model	<u>Mesa Defender 530</u>		
Serial Number	<u>4760</u>			Serial Number	<u>L-153351 H-152571</u>		
Last Verification Date	<u>February 2017</u>			Temperature (°C)	<u>23.0 C</u>		
NO Cylinder S/N	<u>EY0000715</u>			Barometric Pressure	<u>704 mmHg</u>		
NO [PPM]	<u>50.7</u>	NOx [PPM]	<u>50.8</u>				
Expiry Date	<u>May 2021</u>						

Dilution Flow (sccm)			
Pt. #1	<u>5000</u>	Pt. #2	<u>5000</u>
Pt. #3	<u>5000</u>		
Gas Flow (sccm)			
Pt. #1	<u>80</u>	Pt. #2	<u>40</u>
Pt. #3	<u>20</u>		

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
5000	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
4935	77.0	0.7911	0.7926	0.7830	0.0017	0.7846	-1%	-1%
4951	37.5	0.3840	0.3848	0.3808	-0.0001	0.3806	-1%	-1%
4938	18.9	0.1941	0.1944	0.1915	0.0003	0.1918	-1%	-1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	0.9901	0.90-1.10		m (Slope)=	0.9901
b (Intercept % of FS)=	-0.0092	± 3% F.S.		b (Intercept % of FS)=	-0.0320

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas		
4935	0.000	0.0000	0.7877	0.0005	0.7881	NO ₂	% Diff. Limit	
4935	0.500	0.4912	0.2965	0.4844	0.7809	-1%	± 10%	
4935	0.280	0.2755	0.5122	0.2729	0.7851	-1%	± 10%	
4935	0.100	0.0977	0.6900	0.0991	0.7891	1%	± 10%	
Absolute Average Percent Difference							1%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO ₂		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9836	0.90-1.10	
b (Intercept % of FS)=	0.1675	± 3% F.S.	

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Teco 146i</u>	Make/Model	<u>Teco 42i</u>
Serial/AMU Number	<u>AMU 1809</u>	Serial/AMU Number	<u>AMU 1868</u>
SRM Gas Cylinder No.	<u>APEX1170572</u>	Last Calibration Date	<u>March 2, 2018</u>
Cylinder Conc. (ppm)	<u>49.99</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>November 2020</u>

COMMENTS: Cylinder contains 25 ppm SO₂.

Auditor: Al Clark
Operator Signature: *Chris W*

Date: March 2, 2018
Location: McIntyre Center Edmonton

CALIBRATION GASES



Calibration Gas Audit

Single Component Cylinder Gas

File No. 2016-334CGA

Company: Maxxam **Operator's Name:** Russell Kirchner

Cylinder #: EY0000654 Concentration PPM: 10.2 Tolerance(%): 2 Certified By: Praxair

Expiry Date: June 2019

Reference Calibrator and Gas:	Flow Measurement Device:
Make/Model: <u>R&R MFC 201</u>	Make/Model: <u>Bios DC2</u>
Serial Number: <u>AMU 1690</u>	Serial Number: <u>AMU 1659</u>
Last Verification Date: <u>October 19, 2016</u>	Temp. °C: <u>24.0 C</u>
Gas Type: <u>H2S</u> Conc. <u>20.43</u>	B.P. <u>706 mmhg</u>
Cylinder Number: <u>CAL015584</u>	
Expiry Date: <u>January 2019</u>	

Reference Analyzer:

Make/Model: Teco 450i Serial/AMU Number: 1980

Instrument Settings: Zero: 16.6 Span: 1.231 Range: 0.1

Last Calibration: Date: Oct 19/16 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Concentration (PPM)	Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration
Dilution	Gas				
5000	0.0	0.0000	0.0000	0.0000	0.0000
5050	38.0	0.0764	0.00752	132.895	10.2
5050	17.8	0.0355	0.00352	283.708	10.1
5023	9.1	0.0182	0.00181	551.978	10.0
Average Cylinder Concentration:					10.1

Previous Stated Concentration PPM: 10.2

Percent variance from Stated: 1

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____

<=5% Outside Manufacturer Tolerance. Use manufacturers concentration _____

> 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark Date: October 19, 2016

Operator Signature: *Al Clark* Location: McIntyre Center Edmonton



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-029CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: LL165367 **Conc CH4 (PPM)** 590/207 **Tolerance (%)** 2 **Certified By:** Praxair

Reference Calibrator and Gas:				Flow Measurement Device:	
Make/Model	<u>R&R MFC 201</u>			Make/Model	<u>Bios DC2</u>
Serial Number	<u>AMU 1691</u>			Serial Number	<u>AMU 1650</u>
Last Verification Date	<u>May 21, 2015</u>			Temp. °C	<u>24.0 C</u>
Gas Type	<u>CH4</u>	Conc.	<u>999.2</u>	B.P.	<u>703 mmhg</u>
Cylinder Number	<u>D751932</u>				
Gas Type	<u>C3H8</u>	Conc.	<u>246.5</u>		
Cylinder Number	<u>XF0037998</u>				

Reference Analyzer:
 Make/Model Teco 55C Serial/AMU Number: 1643
 Instrument Settings Zero: N/A Span: N/A Range: 20
 Last Calibration: Date: May 21/15 C.F. 1.000 Done By: Al Clark

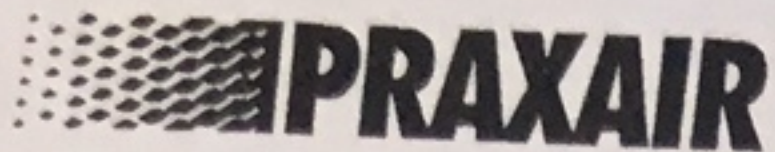
Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2600	0.0	0.00	0.00	0.02005	49.883	602	206
2569	51.5	12.06	11.37	0.02005	49.883	602	206
3549	22.3	3.77	3.57	0.00628	159.148	600	207
3523	10.4	1.77	1.70	0.00295	338.750	600	209
Average Cylinder Concentration:						600	207

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>590</u>	<u>207</u>
Percent variance from Stated: <u>1.8</u>	<u>0.2</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark Date: May 21, 2015
 Operator Signature: _____ Location: McIntyre Center Edmonton



Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Tel: (323) 585-2154 Fax: (714) 542-6689
 PGVPID: F22017

DocNumber: 000116115

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR PKG EDMONTON PLT 8
 9501 34TH ST
 EDMONTON AB T6B 2X

Praxair Order Number: 45314542
 Customer P. O. Number: 582-277
 Customer Reference Number:

Fill Date: 10/12/2017
 Part Number: NI NO50MS2E-AQ
 Lot Number: 70086728507
 Cylinder Style & Outlet: AQ CGA 660
 Cylinder Pressure & Volume: 2000 psig 82 cu. ft.

Certified Concentration:

Expiration Date:	10/24/2020	NIST Traceable
Cylinder Number:	LL104225	Analytical Uncertainty:
51.5 ppm	NITRIC OXIDE	± 0.7 %
49.2 ppm	SULFUR DIOXIDE	± 1 %
Balance	NITROGEN	

NOx = 51.6 ppm

NOx for Reference Only

Certification Information: Certification Date: 10/24/2017 Term: 36 Months Expiration Date: 10/24/2020

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: NITRIC OXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 51.5 ppm
 Instrument Used: Thermo Electron 42i-LS S/N 1030645077
 Analytical Method: Chemiluminescence
 Last Multipoint Calibration: 10/14/2017

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC363145
 Ref. Std. Conc: 50.79 ppm
 Ref. Std. Traceable to SRM #: vs. 1683b
 SRM Sample #: 45.-V-42
 SRM Cylinder #: CAL017897

First Analysis Data:				Date: 10/17/2017
Z: 0	R: 50.8	C: 51.5	Conc: 51.49	
R: 50.8	Z: 0	C: 51.6	Conc: 51.59	
Z: 0	C: 51.6	R: 50.8	Conc: 51.59	
UOM: ppm			Mean Test Assay: 51.557 ppm	

Second Analysis Data:				Date: 10/24/2017
Z: 0	R: 50.8	C: 51.4	Conc: 51.39	
R: 50.8	Z: 0	C: 51.5	Conc: 51.49	
Z: 0	C: 51.4	R: 50.8	Conc: 51.39	
UOM: ppm			Mean Test Assay: 51.423 ppm	

2. Component: SULFUR DIOXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 49.2 ppm
 Instrument Used: Ametek 921CE S/N AW-921-S321
 Analytical Method: Ultraviolet Absorption
 Last Multipoint Calibration: 10/13/2017

Reference Standard Type: NTRM
 Ref. Std. Cylinder #: CC72593
 Ref. Std. Conc: 48.58 ppm
 Ref. Std. Traceable to SRM #: n/a
 SRM Sample #: 12070103
 SRM Cylinder #: N/A

First Analysis Data:				Date: 10/17/2017
Z: 0	R: 48.2	C: 48.8	Conc: 49.151	
R: 48.2	Z: 0	C: 48.8	Conc: 49.151	
Z: 0	C: 48.9	R: 48.3	Conc: 49.251	
UOM: ppm			Mean Test Assay: 49.184 ppm	

Second Analysis Data:				Date: 10/24/2017
Z: 0	R: 48.2	C: 48.7	Conc: 49.084	
R: 48.2	Z: 0	C: 48.8	Conc: 49.185	
Z: 0	C: 48.8	R: 48.2	Conc: 49.185	
UOM: ppm			Mean Test Assay: 49.151 ppm	

Analyzed by:

Henry Koung

Certified by:

Amalia Real

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

***APPENDIX III
AEP AUDIT RESULTS***

STATION AUDIT

File No. 2017-574A/577A

Date: March 15, 2018

Performed by: Shea Beaton

Station

Name: Maskwa

Location: IOL Cold Lake

Facility/Zone: Lica

Operator: Maxxam

Temp: 20.6

Barometric Press: 704mmHg

Location

Latitude N 54°24'50"

Longitude W 110°13'55"

Elevation 530

Status of Site Documentation On Site - Complete

Status of Network Documentation Complete

Status of QAP Last Audited June 2017

Manifold Material Glass

Manifold Condition Good

Meteorological

	Observed	Audit Value
Wind Speed Direction	<u>12km 160Deg</u>	<u>SE 10 -15km/h</u>
Station Temperature	<u>21.9</u>	<u>21</u>
Relative Humidity	<u>43.0%</u>	<u>43.0%</u>
Ambient Temperature	<u>3.2</u>	<u>1.2</u>
	BP <u>937mBar (703mmHg)</u>	<u>704mmHg</u>
Precipitation	<u>1.1mm</u>	<u>11 tips at 0.1mm/tip</u>

Remarks:

SO₂ ANALYZER AUDIT

File No. 2017-574A

Date: March 15, 2018

Performed by: Shea Beaton

Station

Name: Maskwa

Location: IOL Cold Lake

Facility/Zone: Lica

Operator: Maxxam

Temp. 20.6

Barometric Press. 704mmHg

Monitor

Make/Model: TAPI 100E Serial No: 508

Inlet flow (sccm): 578 Full Scale Range ppm: 1.0

Last cal. Date: February 8, 2018 Old Correction Factor: 0.999

Zero/Bkg 164.2

Span Coef 0.953

Calibrator

Calibration Method: GAS DILUTION Make/Model: R&R MFC 201

Cylinder #: EX0012544 AMU #: 1698

CGA Date: 15-Nov-17 SO₂ Concentration PPM: 51.1

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
3550	0.0	3550	0.0000	0.0040		
4082	58.5	4140	0.7221	0.7360	1%	± 10%
4054	26.6	4081	0.3331	0.3370	0%	± 10%
4060	13.5	4073	0.1694	0.1720	-1%	± 10%
Absolute Average Percent Difference					0%	

Linear Regression Analysis:

$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 1.0151

b (Intercept as % of full scale)= 0.1504

LIMITS

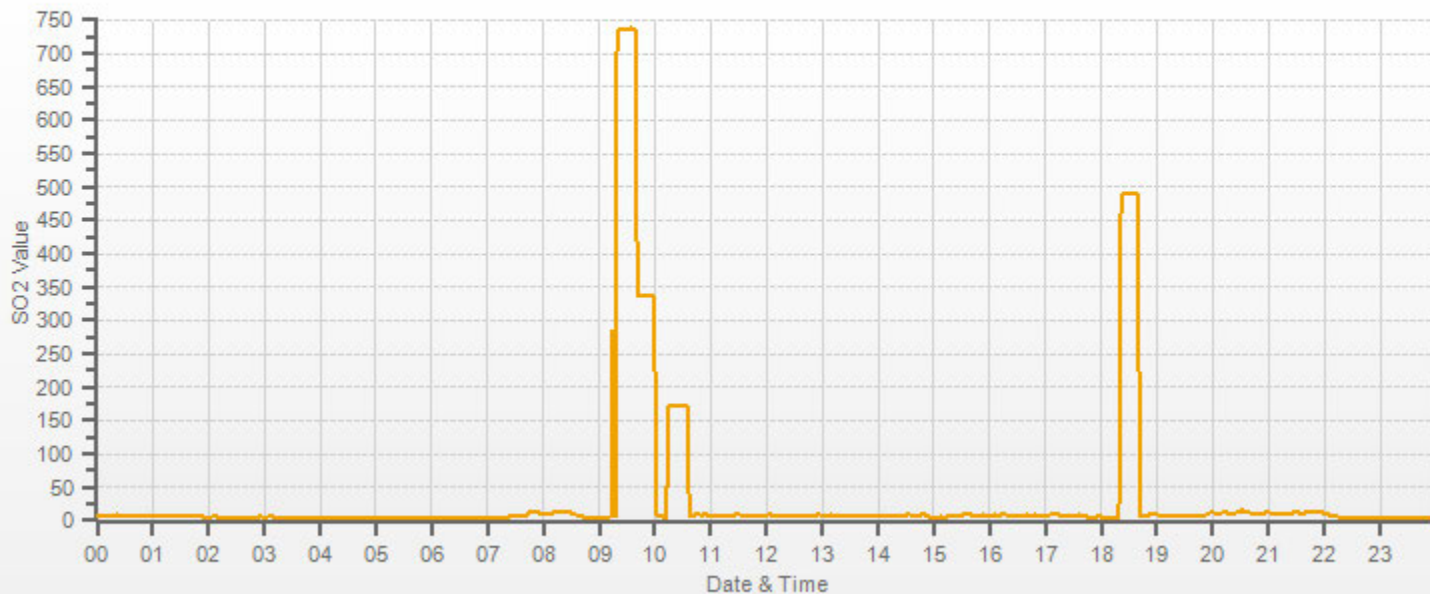
≥ **0.995**

0.90-1.10

± **3% F.S.**

Remarks:

— SO2[ppb]



TRS ANALYZER AUDIT

File No. 2017-575A

Date: March 15, 2018

Performed by: Shea Beaton

Station

Name: Maskwa

Location: IOL Cold Lake

Facility/Zone: Lica

Operator: Maxxam

Temp. 20.6

Barometric Press. 704mmHg

Monitor

Make/Model: TAPI 101E Serial No: 510

Inlet flow (sccm): 524 Full Scale Range ppm: 0.1

Last cal. Date: February 9, 2018 Old Correction Factor: 1.000

Zero/Bkg 33.6

Span Coef 0.970

Calibrator

Calibration Method: GAS DILUTION Make/Model: R&R MFC 201

Cylinder #: EX0009231 AMU #: 1698

CGA Date: 9-Aug-17 H₂S Concentration PPM: 10.0

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
3550	0.0	3550	0.0000	0.0004		
4107	33.4	4140	0.0806	0.0826	2%	± 10%
4066	14.8	4081	0.0362	0.0369	1%	± 10%
4065	7.6	4073	0.0186	0.0193	1%	± 10%
Absolute Average Percent Difference					1%	

Linear Regression Analysis:

$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 1.0201

b (Intercept as % of full scale)= 0.2533

LIMITS

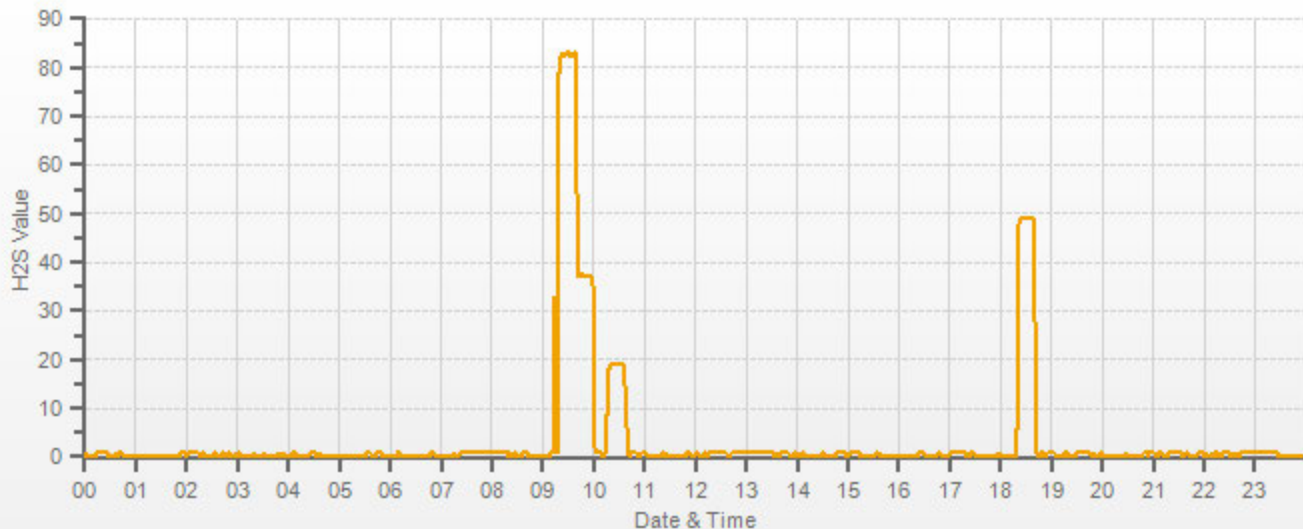
≥ **0.995**

0.90-1.10

± **3% F.S.**

Remarks:

H2S[ppb]



HC ANALYZER AUDIT

File No. 2017-577A

Date: March 15, 2018 Performed by: Shea Beaton

Station

Name: Maskwa Location: IOL Cold Lake
 Facility/Zone: Lica Operator: Maxxam
 Temp. 20.6 Barometric Press. 704mmHg

Monitor

Make/Model: Thermo 51iLT Serial No: 436609738
 Inlet flow (sccm): 9.7psi Full Scale Range ppm: 50.0
 Last cal. Date: February 9, 2018 Old Correction Factor: 0.978

Calibrator

Calibration Method: Gas Dilution
 Make/Model: R&R MFC 201 AMU #: 1698
 HC cylinder #: FF50323 HC concentration ppm: 1988.8

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
3555	0.0	3555	0.00	-0.1		
3558	58.5	3616	32.17	31.8	-1%	± 10%
3552	26.3	3578	14.62	14.1	-3%	± 10%
3558	13.4	3571	7.46	7.1	-4%	± 10%
Absolute Average Percent Difference					2%	

Linear Regression Analysis:

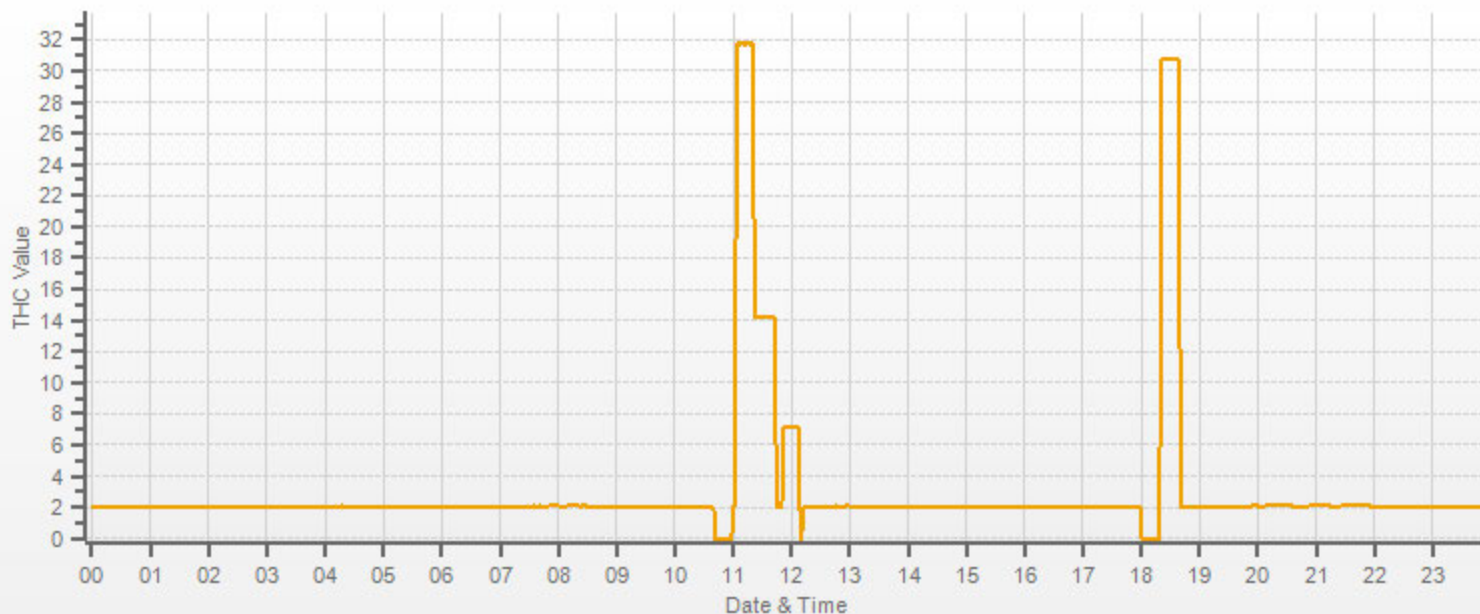
$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

Correlation Coeff.= 0.9999
 m (Slope)= 0.9931
 b (Intercept as % of full scale)= -0.4896

LIMITS
≥ 0.995
0.90-1.10
± 3% F.S.

Remarks:

— THC[ppm]



NO-NOx-NO2 Analyzer Audit

File No. 2017-576A

Date: March 15, 2018 Performed by: Shea Beaton

Station:

Name: Maskwa Location: IOL Cold Lake Operator: Maxxam
Facility/Zone: Lica Temp.: 20.6 BP: 704mmHg

Monitor:

Make/Model: API 200A Serial No. 2051
Inlet flow (scm): 495 Range ppm: 1.0
Last cal. Date: February 8, 2018 Old CF: NO: 0.999
NOx: 1.000
NO2: 1.000
NO Bkg -4.0
NOx Bkg -3.5
NO Coef 1.030
NOx Coef 1.029
NO2 Coef _____

Calibration Method:

Gas Dilution / GPT

Calibrator: Make/Model: Sabio 2010 AMU# 1778
NO cylinder # EX0012160 NO conc. ppm 52.4 NOx conc. ppm 52.7
CGA Date 10-Aug-17

Calibrator Flows			Calc. Conc.		Indicated Concentration		% Difference vs Audit Gas	
Air	Gas	Total	NO (ppm)	NOx (ppm)	NO (ppm)	NOx (ppm)	NO	NOx
5003	0.0	5003	0.0000	0.0000	0.000	0.000	Limit ± 10%	
5004	63.2	5067	0.6536	0.6573	0.655	0.657	0%	0%
5044	34.3	5078	0.3539	0.3560	0.349	0.350	-1%	-2%
5051	14.8	5066	0.1531	0.1540	0.147	0.147	-4%	-5%
Absolute Average Percent Difference							2%	2%

Linear Regression Analysis:

y=mx+b (where x=calculated concentration, y=indicated concentration)

	NO	NOx	NO ₂	LIMITS
Correlation Coeff.=	<u>0.9999</u>	<u>0.9999</u>	<u>1.0000</u>	≥ 0.995
m (Slope)=	<u>1.0043</u>	<u>1.0019</u>	<u>1.0093</u>	0.90-1.10
b (Intercept as % of full scale)=	<u>-0.3657</u>	<u>-0.3867</u>	<u>-0.1502</u>	± 3% F.S.

O ₃ Setting	Flow Rate	Indicated Conc. (ppm)			NO Decrease	NO ₂ Increase	% Difference vs Audit Gas	
		NO	NOx	NO ₂				
0.000	5067	0.650	0.652	0.002	0.401	0.403	0%	± 10%
0.745	5067	0.249	0.654	0.405	0.401	0.403	0%	± 10%
0.411	5067	0.449	0.654	0.204	0.201	0.202	0%	± 10%
0.240	5067	0.550	0.652	0.101	0.100	0.099	-1%	± 10%
Absolute Average Percent Difference							0%	

Converter Efficiency

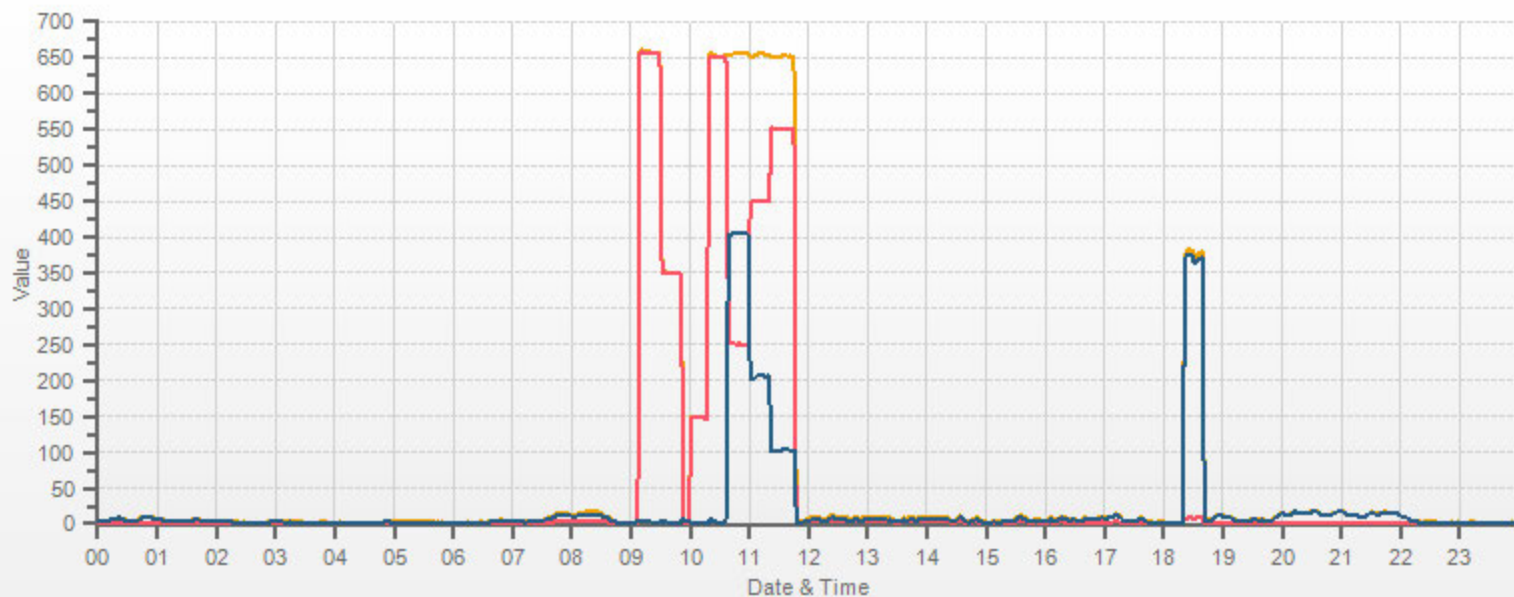
Average Converter Efficiency 100.0%

Remarks:



Station: LICA MASKWA Daily: 18/03/15 Type: AVG 1 Min. [1 Min.]

NOX[ppb] NO[ppb] NO2[ppb]



Station Performance Audit Summary

Company: Lica Facility Name: NA
 Approval No.: NA Site Name: Maskwa
 Region: Lower Athabasca District: Cold Lake
 Parameters audited:

H ₂ S	X	SO ₂	X	NO _x	X	NH ₃		O ₃	
CO		CH ₄		NonCH ₄		THC	X	TRS	
PM _{2.5}		PM ₁₀		TSP		BTEX		Wind Speed	X
Wind Dir	X	Amb. Temp	X	Stn.Temp	X	RH	X	BP	X
Rainfall		Precip	X	VWS		Other			
All parameters monitored as per approval: Yes <u> X </u> No <u> </u> N/A <u> </u>									

GENERAL

	YES	NO	N/A
Has the location remained unchanged from previous audit?	X		
Is site secure?	X		
Are station operating conditions adequate?	X		

DATA ACQUISITION

Are strip charts in use?	X		
Is a telemetry system for data acquisition in use?	X		

SYSTEM COMPONENTS

Is a glass sampling manifold installed?	X		
Is sampling manifold clean?	X		
Is a manifold trap in place?	X		
Are spare manifold ports capped	X		
Is manifold oriented so it is not exactly horizontal?	X		
Are manifold ports situated to prevent water entering monitors?	X		
Is manifold pump properly installed and operative?	X		
Do sample lines extend at least 3/4" into manifold?	X		
Are monitor sampling lines connected to manifold?	X		
Are sampling lines clean?	X		
Are monitors properly mounted and secure?	X		
Are monitors properly exhausted from room or scrubbed?	X		
Are zero and span systems operational?	X		

WIND EQUIPMENT

Is wind sensor properly oriented?	X		
Does wind equipment appear to be functioning properly?	X		
Date of last calibration.	Date:	<u>December 28, 2017</u>	

COMMENTS:

AUDITOR: Shea Beaton DATE: March 15, 2018



Station Site Documents Audit Checklist

Station	
Name: <u>Maskwa</u>	Location: <u>IOL Cold Lake</u>
Facility/Zone: <u>Lica</u>	Operator: <u>Maxxam</u>

Required Elements of AMD Chapter 3 SS 4-B

Do the Site Documents Contain the Following:

- (a) Name of Owner/ Approval Holder
- (b) Name of Operating Agency
- (c) Contact Information
- (d) Date the Site or Station was Established
- (e) Date the information was last updated
- (f) Location including Latitude and Longitude
- (g) Four Colour Photos Looking N, E, S, W From Manifold Inlet
- (h) Additional Photos/Sketches of AMD Standard Site Non-Conformance
- (i) List of Instruments Located at the Site
- (j) Site Description Including the following:
 - (i) Land Use By Sector
 - (ii) Site Elevation
 - (iii) Greatest Angle of Elevation & Direction to Nearby Buildings
 - (iv) Average Building height in the area
 - (v) Distance to Nearest Trees

Meets AMD		NA	Current	
YES	NO		YES	NO
X			X	
X			X	
X			X	
X			X	
X			X	
X			X	
X			X	
		X		
X			X	
X			X	
X			X	
X			X	
X			X	

Required Elements of AMD Chapter 3 SS 4-D

Do the Station Site Documents Contain the Following:

- (a) Recent Area Map Covering Approximately 1Km²
- (b) Plan View Sketch
- (c) Cross-Sectional Sketch of Area Within 500 m Radius
- (d) Colour Photos Showing Sample Manifold/Inlet
- (e) Colour Photo of the Station
- (f) Additional Photos/Sketches of AMD Standard Station Non-Conformance

Meets AMD		NA	Current	
YES	NO		YES	NO
X			X	
X			X	
		X		
X				X
X			X	
	X			

COMMENTS: Inlet/Manifold Photo of Cold Lake South Station Manifold
- Station wind speed/direction sensor does not meet AMD requirements; deficiencies of this
nature must be documented in the station site docs.

AUDITOR: Shea Beaton DATE: March 15, 2018



Audit Summary

Form No. F-AA-018

Version 1.2

Page 3 of 3

Facility / Zone	Lica		
Total # of parameters that passed	17		
Total # of parameters audited in the network	17		
Date(s) of the audit	March 13 to 15 2018		
Issue Date of Audit Summary	23-Mar-18		
Station Name	Maskwa		
Auditor	Shea Beaton		
Audit Date	15-Mar-18		
Critical	Pass	Fail	
H ₂ S	X		
SO ₂	X		
TRS			
NO / NO ₂ / NO _x	X		
O ₃			
THC	X		
Sharp PM _{2.5}			
Wind Speed / Wind Direction	X		
Wind head Orientation	X		
Manifold Fan	X		
Partisol PM _{2.5}			
Zero/Span Systems Operational	X		
Inspection Items	OK	Need for Improvement	
Sample pump venting/scrubbing	X		
Heating / Air Conditioning	X		
Manifold	X		
Sample Lines	X		
Sharp PM _{2.5}			
Partisol PM _{2.5}			
Safety	X		
Site Conditions	X		
Non-critical	OK	Opportunity for Improvement	
RH	X		
Station Temperature	X		
Ambient Temperature		X	+/- 1°C
Barometric Pressure	X		
Tipping bucket	X		
Station Condition	X		
Station Documentation	X		

Not monitored at this location

APPENDIX IV
MAXIMUM INSTANTANEOUS DATA



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - March 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	4	4	4	4	3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	4	3	24	
2	3	3	3	2	2	3	3	3	S	2	3	3	4	7	8	10	8	10	3	3	3	3	3	3	2	10	4	24	
3	3	4	3	3	3	3	3	S	3	3	3	4	4	4	4	4	4	4	5	5	10	10	6	5	3	10	4	24	
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9	8	S	7	7	7	6	6	6	7	6	6	10	10	6	7	6	5	5	5	5	5	5	6	6	5	10	6	24	
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24	3	5	4	6	4	5	4	4	4	S	6	7	8	5	10	6	5	3	3	3	3	3	3	3	3	10	5	24	
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26	3	3	3	3	3	3	S	3	3	3	3	4	6	5	5	5	12	8	4	4	4	4	6	5	3	12	4	24	
27	4	3	3	3	3	3	S	3	3	3	6	10	6	5	3	4	3	3	3	3	3	3	2	2	2	10	4	24	
28	2	2	2	2	2	S	3	3	3	3	4	3	4	4	11	5	7	13	12	13	3	3	2	2	2	13	5	24	
29	2	2	2	1	S	1	1	1	1	1	2	3	4	4	2	2	2	1	1	1	1	1	2	2	1	4	2	24	
30	2	2	2	S	2	2	2	2	2	3	3	3	2	3	6	6	9	2	2	1	6	9	13	9	1	13	4	24	
31	13	12	S	4	3	1	1	2	3	3	1	1	1	2	1	2	2	2	2	2	2	2	2	2	1	13	3	24	
HOURLY MAX	13	12	10	12	11	10	9	14	13	15	10	13	11	11	18	12	14	14	13	12	15	14	14	9					
HOURLY AVG	4	4	4	4	4	4	4	4	4	5	4	5	5	5	6	6	5	5	4	4	4	4	4	4					

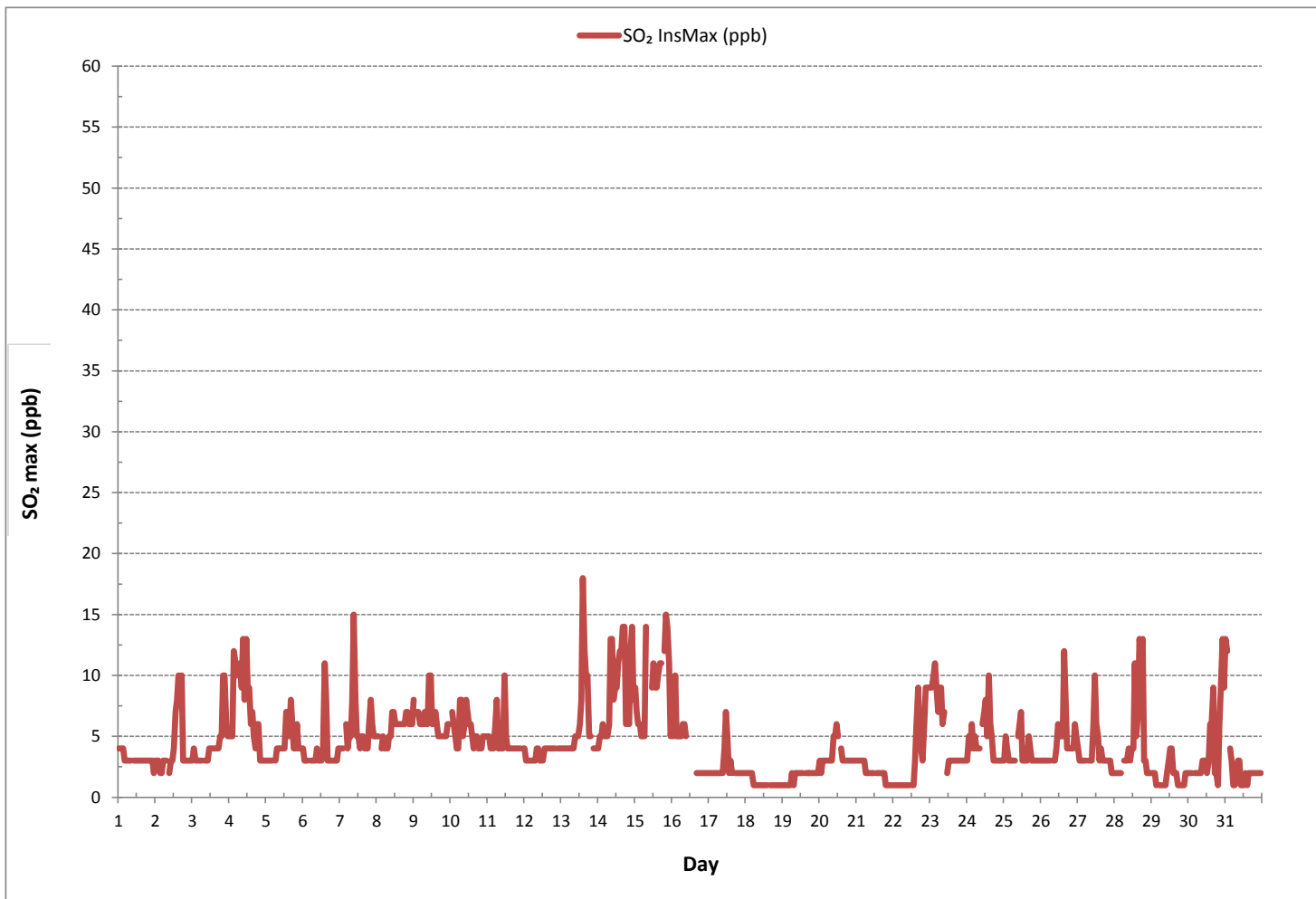
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	704
MAXIMUM INSTANTANEOUS VALUE:	18 ppb @ HOUR 14 ON DAY 13
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
STANDARD DEVIATION:	3
OPERATIONAL TIME:	744 hrs

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	0	1	0	0	0	0	0	0	0	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
2	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	24
3	0	0	0	0	0	0	0	S	0	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	0	24
4	0	0	0	1	0	0	S	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
5	0	0	0	0	0	S	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	24
6	0	0	0	0	S	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	24
7	0	0	0	S	0	0	1	1	1	1	1	1	0	0	1	1	0	0	0	1	1	1	1	1	1	0	1	1	24
8	1	1	S	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24
9	1	S	1	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	24
10	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	S	0	1	1	24
11	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	24	
12	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	S	1	1	0	1	0	24
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	0	0	0	1	1	24
14	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	0	1	1	24
15	1	1	1	1	1	1	1	1	0	Q	Q	Q	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	24
16	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	1	1	24
17	0	0	0	0	0	0	0	0	1	0	0	0	2	1	0	0	S	0	0	0	0	0	0	0	0	0	2	0	24
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24
20	0	0	0	0	0	0	0	0	0	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
21	0	0	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
22	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	24
23	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	24
24	1	1	0	1	1	1	0	1	1	S	1	0	1	1	1	0	0	2	0	0	0	0	0	0	0	0	2	1	24
25	1	0	2	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24
26	0	0	0	0	0	0	1	S	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	24
27	0	0	0	0	0	0	S	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
28	0	0	0	0	0	S	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	24
29	0	0	0	0	S	2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	24
30	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
31	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	1	1	2	2	1	2	1	1	2	3	2	1	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1
HOURLY AVG	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

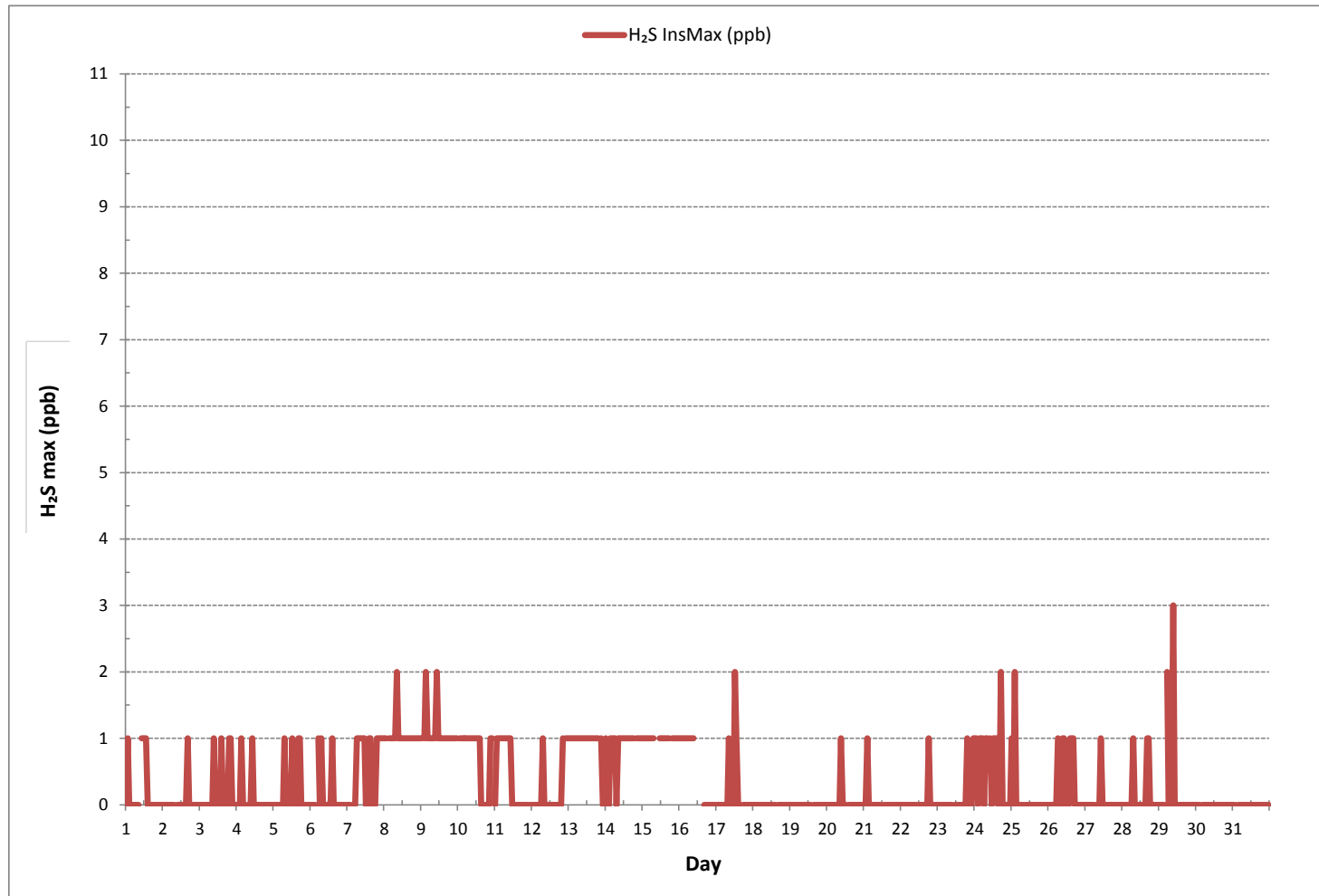
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	213
MAXIMUM INSTANTANEOUS VALUE:	3 ppb @ HOUR 9 ON DAY 29
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	6 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	0

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - March 2018

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY MIN.	DAILY MAX.	24-HR AVG.	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59					
DAY 1	2.05	2.05	2.05	2.05	2.07	2.07	2.08	2.08	2.10	S	2.07	2.07	2.10	2.08	2.10	2.10	2.10	2.10	2.10	2.10	2.13	2.13	2.13	2.13	2.05	2.13	2.09	24	
2	2.14	2.14	2.16	2.17	2.17	2.14	2.14	2.16	S	2.19	2.19	2.13	2.13	2.17	2.14	2.16	2.17	2.20	2.12	2.13	2.13	2.13	2.13	2.13	2.12	2.20	2.15	24	
3	2.13	2.11	2.11	2.11	2.13	2.11	2.10	S	2.10	2.10	2.10	2.10	2.07	2.07	2.07	2.07	2.08	2.10	2.10	2.16	2.15	2.13	2.10	2.07	2.16	2.10	24		
4	2.11	2.11	2.12	2.19	2.20	2.26	S	2.17	2.14	2.17	2.16	2.17	2.14	2.13	2.12	2.13	2.11	2.10	2.11	2.17	2.14	2.10	2.10	2.10	2.10	2.26	2.14	24	
5	2.11	2.10	2.08	2.08	2.08	S	2.07	2.08	2.08	2.08	2.08	2.07	2.07	2.07	2.07	2.08	2.07	2.07	2.07	2.11	2.13	2.10	2.13	2.14	2.07	2.14	2.09	24	
6	2.16	2.19	2.20	2.20	S	2.23	2.23	2.23	2.25	2.25	2.23	2.19	2.17	2.20	2.19	2.14	2.14	2.17	2.21	2.25	2.25	2.26	2.25	2.26	2.14	2.26	2.21	24	
7	2.26	2.26	2.29	S	2.32	2.37	2.41	2.54	2.63	2.63	2.44	2.35	2.34	2.26	2.25	2.23	2.17	2.11	2.13	2.16	2.20	2.28	2.29	2.44	2.11	2.63	2.32	24	
8	2.43	2.61	S	2.58	2.54	2.54	2.78	2.92	2.89	2.69	2.51	2.34	2.41	2.32	2.31	2.25	2.28	2.26	2.23	2.23	2.17	2.20	2.29	2.29	2.17	2.92	2.44	24	
9	2.16	S	2.04	2.04	2.01	2.01	2.01	1.98	1.98	2.51	2.04	2.19	2.04	2.07	2.07	2.10	2.11	2.17	2.20	2.23	2.28	2.32	2.34	1.98	2.51	2.13	24		
10	S	2.31	2.20	2.38	2.40	2.96	3.06	2.51	2.47	2.37	2.41	2.51	2.39	2.38	2.20	2.04	2.10	2.10	2.14	2.17	2.20	2.25	2.29	S	2.04	3.06	2.36	24	
11	2.41	2.51	2.48	2.63	3.15	2.78	2.69	2.99	2.73	2.47	2.26	2.29	2.14	2.13	2.17	2.16	2.21	2.21	2.34	2.32	2.35	2.69	S	2.76	2.13	3.15	2.47	24	
12	2.63	2.72	2.66	2.67	2.66	2.72	2.67	2.75	2.81	2.67	2.47	2.44	2.36	2.29	2.33	2.32	2.41	2.43	2.44	2.47	2.45	S	2.69	2.72	2.29	2.81	2.56	24	
13	2.72	2.75	2.76	3.03	2.72	2.73	2.79	2.92	3.69	2.84	2.57	2.44	2.38	2.44	2.48	2.41	2.21	2.29	2.29	2.44	S	2.26	2.26	2.21	2.21	3.69	2.59	24	
14	2.19	2.18	2.17	2.17	2.19	2.17	2.17	2.17	2.31	2.23	2.32	2.16	2.17	2.13	2.10	2.07	2.10	2.08	1.99	S	1.99	2.07	2.08	2.04	1.99	2.32	2.14	24	
15	2.04	2.01	1.99	2.02	2.05	2.04	2.01	2.08	2.08	1.98	Q	Q	Q	2.07	2.07	2.02	2.04	2.07	S	2.08	2.13	2.10	2.04	2.01	1.98	2.13	2.05	24	
16	2.08	2.04	2.10	2.01	2.04	2.01	2.01	2.02	2.04	2.28	2.05	2.07	2.10	2.10	C	C	C	C	C	2.34	2.37	2.35	2.39	2.50	2.01	2.50	2.15	24	
17	2.48	2.43	2.48	2.47	2.44	2.41	2.43	2.43	2.51	2.43	2.23	2.21	2.13	2.07	2.07	2.07	S	2.23	2.26	2.26	2.07	2.07	2.07	2.08	2.07	2.51	2.28	24	
18	2.08	2.10	2.08	2.10	2.10	2.13	2.13	2.13	2.14	2.13	2.13	2.13	2.13	2.13	S	2.13	2.13	2.13	2.17	2.16	2.14	2.17	2.20	2.08	2.20	2.13	24		
19	2.32	2.29	2.19	2.23	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.20	2.25	2.34	S	2.31	2.37	2.41	2.38	2.39	2.41	2.43	2.45	2.50	2.17	2.50	2.29	24	
20	2.47	2.51	2.57	2.60	2.64	2.66	2.57	2.41	2.36	2.38	2.32	2.26	2.29	S	2.29	2.29	2.25	2.22	2.15	2.19	2.14	2.20	2.29	2.41	2.14	2.66	2.37	24	
21	2.47	2.51	2.52	2.54	2.34	2.26	2.17	2.15	2.13	2.13	2.11	2.10	S	2.07	2.08	2.10	2.10	2.11	2.13	2.14	2.16	2.16	2.17	2.07	2.54	2.21	24		
22	2.17	2.18	2.19	2.20	2.23	2.23	2.20	2.20	2.20	2.20	2.20	S	2.17	2.17	2.20	2.20	2.20	2.20	2.14	2.17	2.20	2.23	2.20	2.17	2.14	2.23	2.19	24	
23	2.17	2.17	2.13	2.13	2.10	2.08	2.10	2.08	2.04	2.05	S	1.99	1.99	2.01	2.01	2.04	2.04	2.07	2.07	2.13	2.17	2.15	2.17	2.31	1.99	2.31	2.10	24	
24	2.31	2.17	2.14	2.13	2.05	2.10	2.15	2.20	2.20	S	2.20	2.16	2.16	2.13	2.13	2.02	2.01	1.98	1.99	2.01	2.01	1.99	2.01	2.01	1.98	2.31	2.10	24	
25	2.02	2.04	2.04	2.04	2.05	2.07	2.04	2.04	S	2.07	2.07	2.07	2.04	2.04	2.02	2.04	2.05	2.07	2.07	2.08	2.13	2.08	2.04	2.02	2.02	2.13	2.05	24	
26	2.04	2.04	2.04	2.02	2.11	2.16	2.35	S	2.57	2.38	2.32	2.16	2.10	2.10	2.13	2.07	2.04	2.02	2.05	2.08	2.08	2.07	2.07	2.07	2.02	2.57	2.13	24	
27	2.07	2.07	2.05	2.04	2.02	2.04	S	2.02	2.01	2.01	2.10	2.08	2.04	2.05	1.98	1.98	1.99	2.01	2.02	2.05	2.10	2.13	2.60	2.44	1.98	2.60	2.08	24	
28	2.20	2.23	2.23	2.19	2.26	S	2.19	2.17	2.17	2.17	2.10	2.11	2.10	2.13	2.05	2.07	2.10	2.10	2.08	2.13	2.13	2.16	2.16	2.17	2.05	2.26	2.15	24	
29	2.20	2.20	2.22	2.23	S	2.26	2.26	2.25	2.23	2.21	2.23	2.23	2.20	2.23	2.23	2.23	2.23	2.23	2.23	2.25	2.28	2.26	2.25	2.26	2.28	2.20	2.28	2.24	24
30	2.28	2.32	2.35	S	2.32	2.29	2.25	2.28	2.23	2.19	2.20	2.20	2.17	2.17	2.19	2.20	2.22	2.20	2.22	2.25	2.29	2.35	2.35	2.17	2.35	2.17	2.35	2.26	24
31	2.31	2.31	S	2.29	2.31	2.26	2.28	2.28	2.26	2.26	2.21	2.20	2.19	2.17	2.17	2.17	2.14	2.13	2.13	2.16	2.16	2.17	2.19	2.19	2.13	2.31	2.21	24	
HOURLY MAX	2.72	2.75	2.76	3.03	3.15	2.96	3.06	2.99	3.69	2.84	2.57	2.51	2.41	2.44	2.48	2.41	2.41	2.43	2.44	2.47	2.45	2.69	2.69	2.76					
HOURLY AVG	2.24	2.26	2.23	2.26	2.27	2.28	2.29	2.29	2.33	2.27	2.24	2.19	2.18	2.16	2.15	2.14	2.14	2.15	2.16	2.19	2.18	2.20	2.22	2.25					

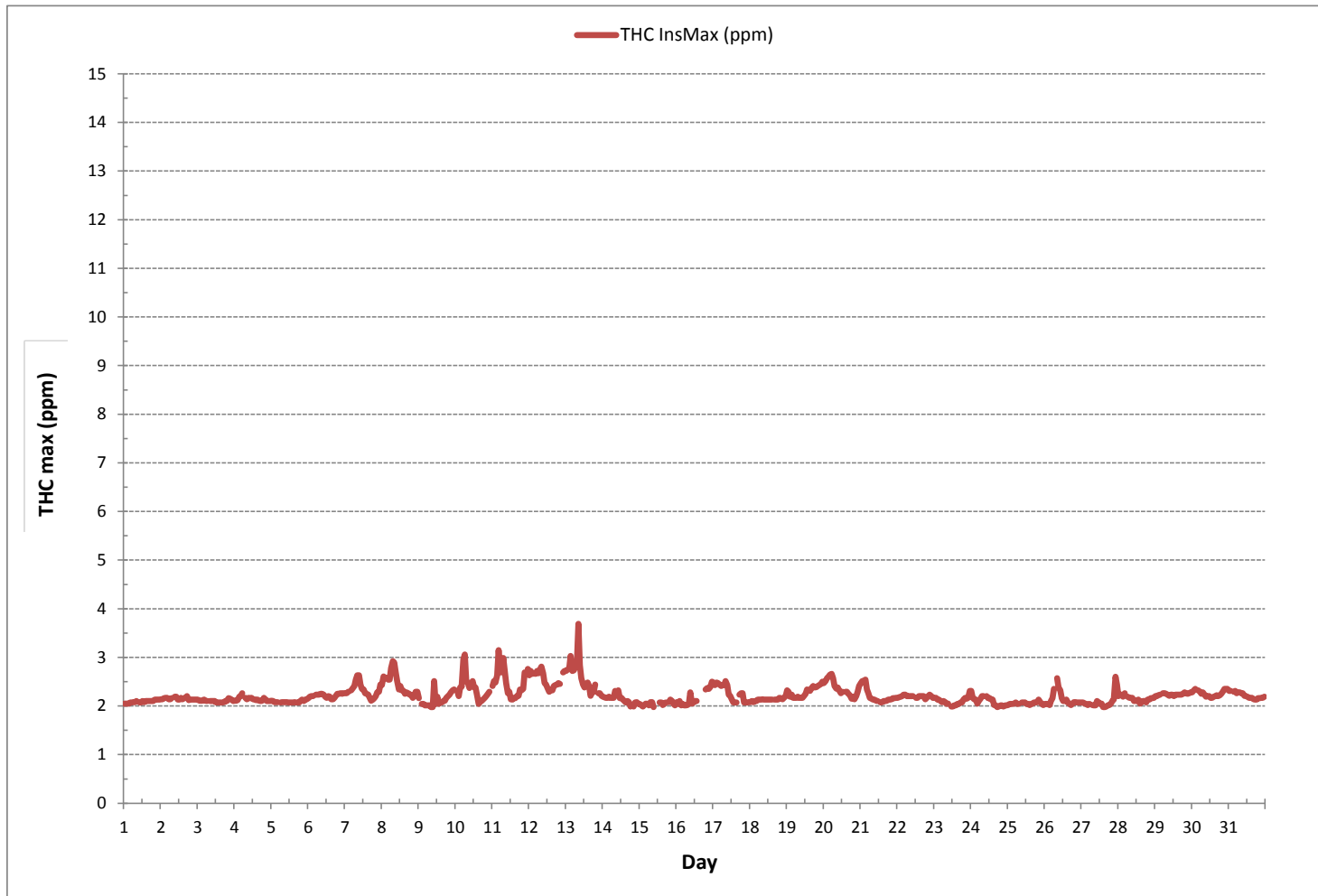
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	705
MAXIMUM INSTANTANEOUS VALUE:	3.69 ppm @ HOUR 8 ON DAY 13
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	0.20

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - March 2018

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	1	1	1	1	1	1	0	0	1	S	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	1	24	
2	1	1	1	1	0	1	0	1	S	2	1	1	3	7	10	10	9	11	1	1	1	1	1	1	0	11	3	24	
3	1	2	1	1	1	1	1	S	2	1	2	3	2	2	2	2	2	3	5	4	11	13	6	4	1	13	3	24	
4	4	4	3	13	11	9	S	13	8	13	7	11	8	9	4	6	3	2	5	4	2	1	1	1	1	13	6	24	
5	1	1	1	1	1	S	3	2	19	18	4	6	2	7	8	12	12	23	4	7	3	3	3	1	23	7	24		
6	5	2	3	3	S	45	12	44	9	7	4	3	4	4	31	16	4	30	3	3	4	4	4	4	2	45	11	24	
7	5	6	6	S	11	9	13	21	22	52	20	10	11	24	13	9	8	7	7	7	8	6	7	7	5	52	13	24	
8	7	96	S	10	9	7	16	69	65	42	26	9	7	9	7	6	6	4	4	4	3	3	4	3	3	96	18	24	
9	7	S	6	6	3	3	3	4	3	3	7	7	41	31	13	26	6	3	3	4	4	5	7	64	3	64	11	24	
10	S	18	18	3	3	4	16	62	17	14	20	15	11	12	8	4	4	4	4	4	4	5	10	8	S	3	62	12	24
11	11	21	23	109	29	14	59	35	38	32	10	9	7	3	3	3	4	5	5	4	5	7	S	7	3	109	19	24	
12	6	6	6	5	5	6	13	23	16	8	6	5	5	3	4	4	4	7	5	6	54	S	5	5	3	54	9	24	
13	5	6	5	4	4	4	60	65	56	11	7	6	10	28	23	17	13	10	4	4	S	3	3	3	3	65	15	24	
14	2	2	3	4	2	3	3	5	16	16	9	9	10	11	12	13	14	14	3	S	4	11	16	6	2	16	8	24	
15	8	7	4	3	4	2	5	15	Q	Q	Q	Q	11	9	12	10	9	13	S	14	18	18	12	2	2	18	9	24	
16	4	3	11	3	2	3	4	6	5	5	C	C	C	C	C	C	C	C	C	C	4	6	5	5	4	2	11	5	24
17	4	3	3	4	6	6	4	8	7	3	6	10	7	2	2	2	S	3	6	4	2	1	1	0	0	10	4	24	
18	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	3	2	1	0	1	0	3	0	24	
19	4	3	1	1	1	1	2	2	2	3	5	5	3	3	S	3	4	4	4	4	4	3	3	3	3	1	5	3	24
20	3	3	4	4	5	6	20	7	7	11	9	10	8	S	7	7	7	6	4	4	4	5	6	7	3	20	7	24	
21	8	14	16	7	4	3	2	2	2	2	1	1	S	2	1	1	1	1	1	1	1	1	0	1	0	16	3	24	
22	1	0	1	0	1	1	0	0	0	0	0	S	2	2	5	11	11	8	4	4	7	13	14	13	0	14	4	24	
23	14	14	13	13	11	10	14	14	9	11	S	2	2	2	2	2	3	4	3	6	4	3	3	2	2	14	7	24	
24	2	6	5	9	5	5	9	4	5	S	9	11	14	7	31	11	9	3	2	2	2	2	1	1	1	31	7	24	
25	2	4	3	3	2	2	1	1	S	6	9	9	3	1	1	2	4	3	2	3	3	2	1	0	0	9	3	24	
26	0	0	0	0	4	5	S	9	8	8	19	8	7	9	31	18	4	4	4	3	3	3	3	0	31	7	24		
27	2	2	1	1	0	0	S	2	1	0	4	8	6	6	1	2	0	2	2	1	1	2	9	10	0	10	3	24	
28	2	2	2	2	4	S	22	65	47	7	4	21	6	22	4	11	26	26	35	2	2	0	0	0	0	65	14	24	
29	0	0	0	0	S	2	5	3	1	2	3	7	8	10	3	4	3	3	3	2	2	3	3	4	0	10	3	24	
30	3	3	3	S	3	3	4	4	2	3	2	3	2	4	10	33	28	3	2	1	15	35	33	25	1	35	10	24	
31	33	68	S	7	10	5	7	28	24	6	2	1	0	1	2	2	0	1	0	1	1	0	1	2	0	68	9	24	
HOURLY MAX	33	96	23	109	29	45	60	69	65	52	26	21	41	31	31	33	28	30	35	14	54	35	33	64					
HOURLY AVG	5	10	5	8	5	6	10	17	14	10	7	7	7	8	8	9	7	7	5	4	6	6	5	6					

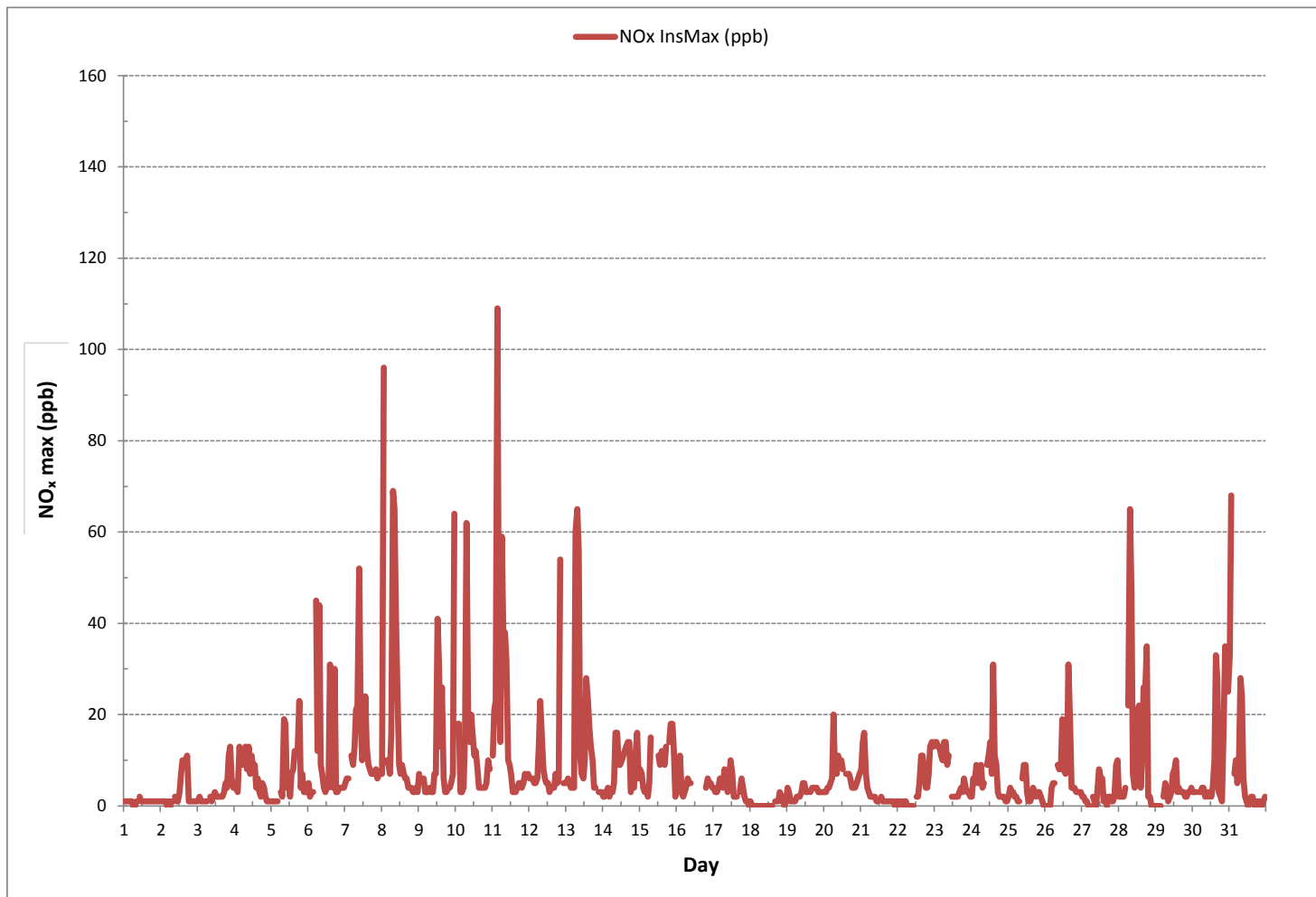
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	652
MAXIMUM INSTANTANEOUS VALUE:	109 ppb @ HOUR 3 ON DAY 11
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	11

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - March 2018

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0	0	1	0	1	1	0	0	1	S	1	1	0	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0	1	1	24
2	1	1	1	1	1	1	0	1	S	1	1	1	1	1	3	3	3	2	2	1	1	1	1	1	1	1	0	3	1	24		
3	1	1	1	0	1	1	1	S	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	24		
4	1	1	1	1	1	1	S	1	1	3	1	3	2	2	1	1	1	1	1	1	0	1	1	1	1	0	3	1	1	24		
5	1	1	1	0	1	S	1	1	9	5	1	3	1	2	3	5	5	2	5	1	1	1	1	1	1	0	9	2	1	24		
6	1	1	1	1	S	20	3	25	3	3	1	1	1	2	16	8	1	18	1	1	1	1	1	1	1	1	25	5	1	24		
7	1	1	1	S	1	1	2	6	8	29	9	4	4	9	7	3	3	1	1	1	1	1	1	1	1	1	29	4	1	24		
8	1	55	S	1	1	1	1	40	42	23	11	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	55	9	1	24		
9	1	S	1	1	1	1	1	1	1	1	1	1	12	16	3	7	1	1	1	1	1	1	1	1	29	1	29	4	1	24		
10	S	1	1	1	1	1	2	32	4	5	9	6	4	5	3	1	1	1	1	0	0	2	1	S	0	32	4	1	24			
11	1	1	1	1	79	5	1	19	5	18	14	3	3	2	1	1	1	1	1	1	1	1	1	S	1	1	79	7	1	24		
12	1	1	1	1	1	1	1	7	5	2	2	1	1	1	1	1	1	1	1	1	1	19	S	1	1	1	19	2	1	24		
13	1	1	1	1	1	1	20	32	24	3	1	1	3	14	6	4	3	1	1	1	S	1	1	1	1	1	32	5	1	24		
14	1	1	1	1	1	1	1	1	4	4	3	3	3	3	4	3	3	3	3	1	S	1	1	1	1	1	4	2	1	24		
15	1	1	1	1	1	1	1	3	Q	Q	Q	Q	4	3	4	3	3	2	S	1	1	1	1	1	1	1	4	2	1	24		
16	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	C	C	C	C	0	0	0	0	0	0	0	1	1	1	24		
17	0	0	0	0	0	0	0	1	1	0	1	2	1	0	0	0	S	0	0	0	0	0	0	0	0	0	2	0	0	24		
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
19	0	0	0	0	0	0	0	0	0	1	1	1	1	1	S	0	0	0	0	0	0	0	0	0	0	0	1	0	0	24		
20	0	0	0	0	0	0	7	1	1	2	2	3	2	S	1	1	0	0	0	0	0	0	0	0	0	0	7	1	0	24		
21	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
22	0	0	0	0	0	0	0	0	0	0	S	0	0	0	1	3	3	1	0	0	0	0	1	1	1	0	3	0	0	24		
23	1	1	1	1	1	1	1	2	1	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	24		
24	0	0	0	0	0	0	2	0	1	S	1	3	3	1	12	3	2	0	0	0	0	0	0	0	0	0	12	1	0	24		
25	0	0	0	0	0	0	0	0	S	1	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	24		
26	0	0	0	0	0	1	1	S	1	2	2	6	3	1	3	10	4	0	0	0	0	0	0	0	0	0	10	1	0	24		
27	0	0	0	0	0	0	S	0	0	0	1	3	3	2	0	1	0	0	0	0	0	0	0	1	1	0	3	1	0	24		
28	0	0	0	0	0	S	7	38	28	3	1	13	2	9	1	4	10	10	11	0	0	0	0	0	0	38	6	0	24			
29	0	0	0	0	S	0	1	1	0	1	1	4	4	5	1	2	1	1	0	0	0	0	0	0	0	0	5	1	0	24		
30	0	0	0	S	1	0	1	1	1	1	1	1	1	2	5	17	14	1	0	0	1	10	8	5	0	17	3	0	24			
31	7	45	S	1	1	2	3	18	13	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	45	4	0	24		
HOURLY MAX	7	55	1	79	5	20	20	40	42	29	11	13	12	16	16	17	14	18	11	1	19	10	8	29								
HOURLY AVG	1	4	1	3	1	1	3	8	6	4	2	3	2	3	3	3	2	2	1	0	1	1	1	2								

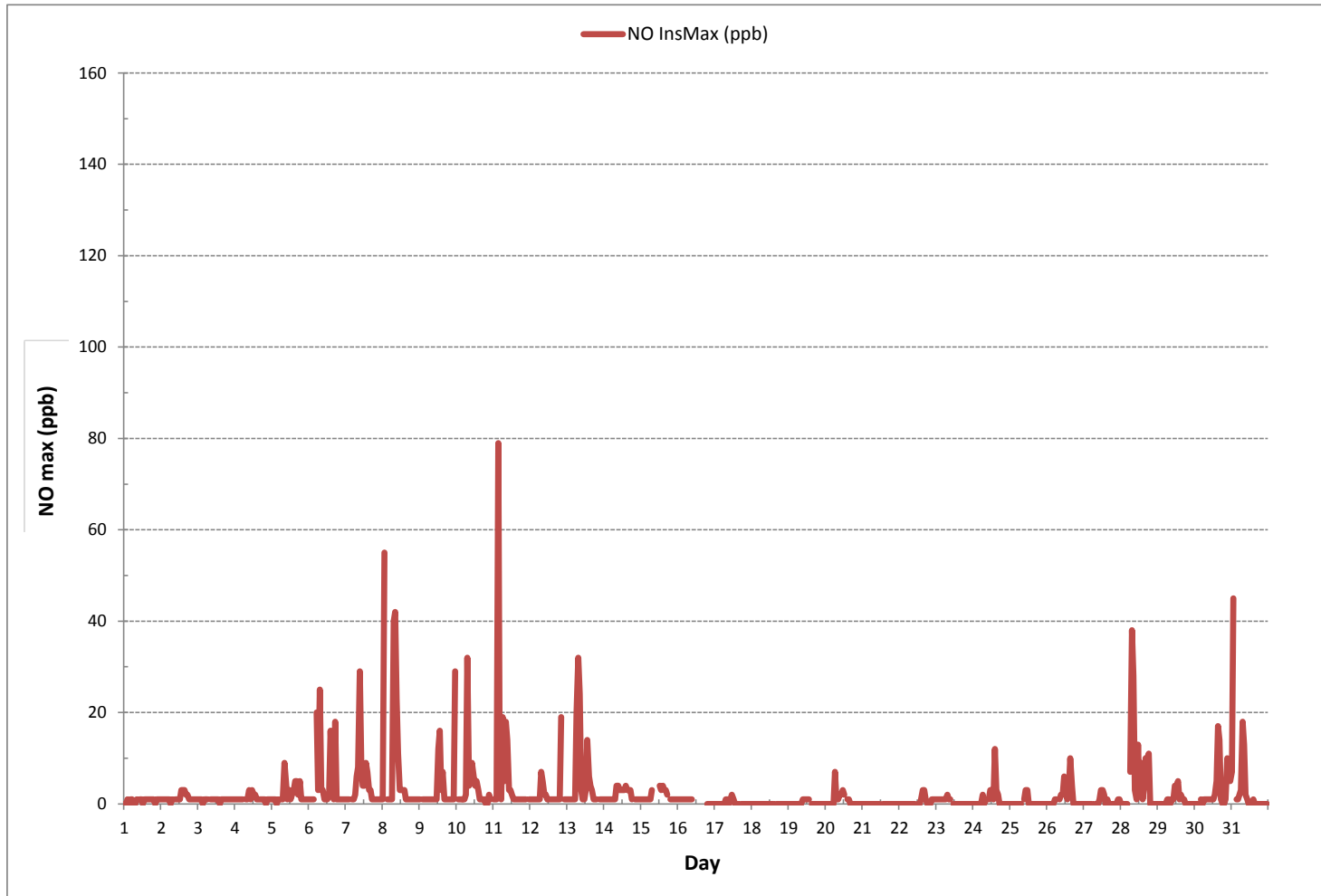
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	454
MAXIMUM INSTANTANEOUS VALUE:	79 ppb @ HOUR 3 ON DAY 11
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
STANDARD DEVIATION:	6
OPERATIONAL TIME:	744 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
Maskwa Continuous Monitoring Station - March 2018

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	1	1	1	1	1	0	1	0	0	S	1	1	1	1	1	0	1	0	0	0	0	1	0	0	0	1	1	24	
2	0	0	0	0	0	0	0	0	S	1	1	1	2	5	7	7	7	10	1	1	1	1	1	0	0	10	2	24	
3	1	1	1	1	1	1	1	S	1	1	1	3	1	1	1	1	1	3	4	3	10	11	5	4	1	11	3	24	
4	4	3	3	11	10	8	S	12	7	11	5	8	6	6	3	4	3	1	5	4	1	1	1	0	0	12	5	24	
5	1	1	1	1	1	S	3	1	11	13	3	3	1	4	5	7	8	11	18	4	7	3	3	3	1	18	5	24	
6	5	1	2	2	S	25	9	19	6	4	3	2	3	3	17	10	3	17	3	3	3	4	4	4	1	25	7	24	
7	4	5	6	S	10	9	11	16	14	23	10	5	6	16	8	5	5	5	7	6	7	6	7	7	4	23	9	24	
8	7	41	S	9	8	7	15	31	31	20	14	6	5	7	5	4	4	4	3	4	3	3	3	3	3	41	10	24	
9	7	S	6	5	3	3	3	4	2	3	6	6	28	17	10	20	5	3	3	4	4	5	7	35	2	35	8	24	
10	S	18	17	3	3	3	14	32	14	9	11	9	7	8	5	3	4	4	4	4	4	5	8	8	S	3	32	9	24
11	11	20	21	47	24	14	40	31	21	18	7	6	5	3	3	2	4	5	5	4	5	6	S	7	2	47	13	24	
12	6	5	5	5	4	5	11	15	11	6	5	4	4	3	3	3	4	6	5	5	5	37	S	4	4	3	37	7	24
13	5	5	5	4	4	4	42	35	32	8	5	5	8	15	17	14	10	9	4	4	S	3	2	2	2	42	11	24	
14	2	2	3	3	2	3	2	4	13	13	7	7	7	8	9	10	11	13	2	S	4	11	15	5	2	15	7	24	
15	8	6	3	3	3	1	5	13	Q	Q	Q	Q	7	6	8	7	7	11	S	14	18	18	11	1	1	18	8	24	
16	3	3	10	3	2	2	3	5	4	4	C	C	C	C	C	C	C	C	C	C	5	5	5	5	4	2	10	4	24
17	4	4	4	5	6	5	5	7	7	3	5	8	7	2	2	1	S	4	6	4	1	1	1	1	1	8	4	24	
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	3	3	1	1	1	1	1	3	1	24
19	4	3	1	1	1	1	1	1	3	3	4	3	3	3	S	3	4	4	4	4	4	4	4	4	4	1	4	3	24
20	4	4	4	4	5	6	14	6	7	9	7	7	6	S	6	6	6	5	5	4	4	5	5	7	4	14	6	24	
21	8	14	15	8	4	3	3	2	2	2	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	15	3	24
22	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	4	8	9	7	5	4	7	13	14	12	1	14	4	24
23	13	13	13	12	11	10	13	14	8	10	S	2	2	2	3	3	3	5	3	6	4	3	3	3	2	14	7	24	
24	3	6	5	9	5	5	7	4	4	S	7	9	11	6	20	8	7	3	1	2	2	1	1	1	1	1	20	6	24
25	1	4	3	3	1	1	1	1	S	5	7	7	2	1	1	1	4	3	3	3	3	1	1	1	1	1	7	3	24
26	1	1	1	1	4	4	4	S	7	7	6	13	5	5	7	22	15	4	4	4	3	3	3	3	1	22	6	24	
27	2	2	1	1	1	1	S	1	1	1	3	5	4	4	1	1	1	1	2	1	1	1	7	10	1	10	2	24	
28	3	2	3	2	4	S	15	34	21	5	2	10	4	14	3	7	16	18	26	2	1	0	0	0	0	34	8	24	
29	0	0	0	0	S	1	4	3	1	1	1	2	4	4	5	2	2	2	2	3	2	2	3	4	0	5	2	24	
30	3	3	4	S	4	3	4	3	1	2	1	2	1	2	4	16	15	3	1	1	14	27	24	21	1	27	7	24	
31	25	33	S	7	10	4	5	11	12	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	33	5	24
HOURLY MAX	25	41	21	47	24	25	42	35	32	23	14	13	28	17	20	22	16	18	26	14	37	27	24	35					
HOURLY AVG	5	7	5	5	5	5	8	11	9	7	5	5	5	5	5	6	6	5	4	4	5	5	5	5					

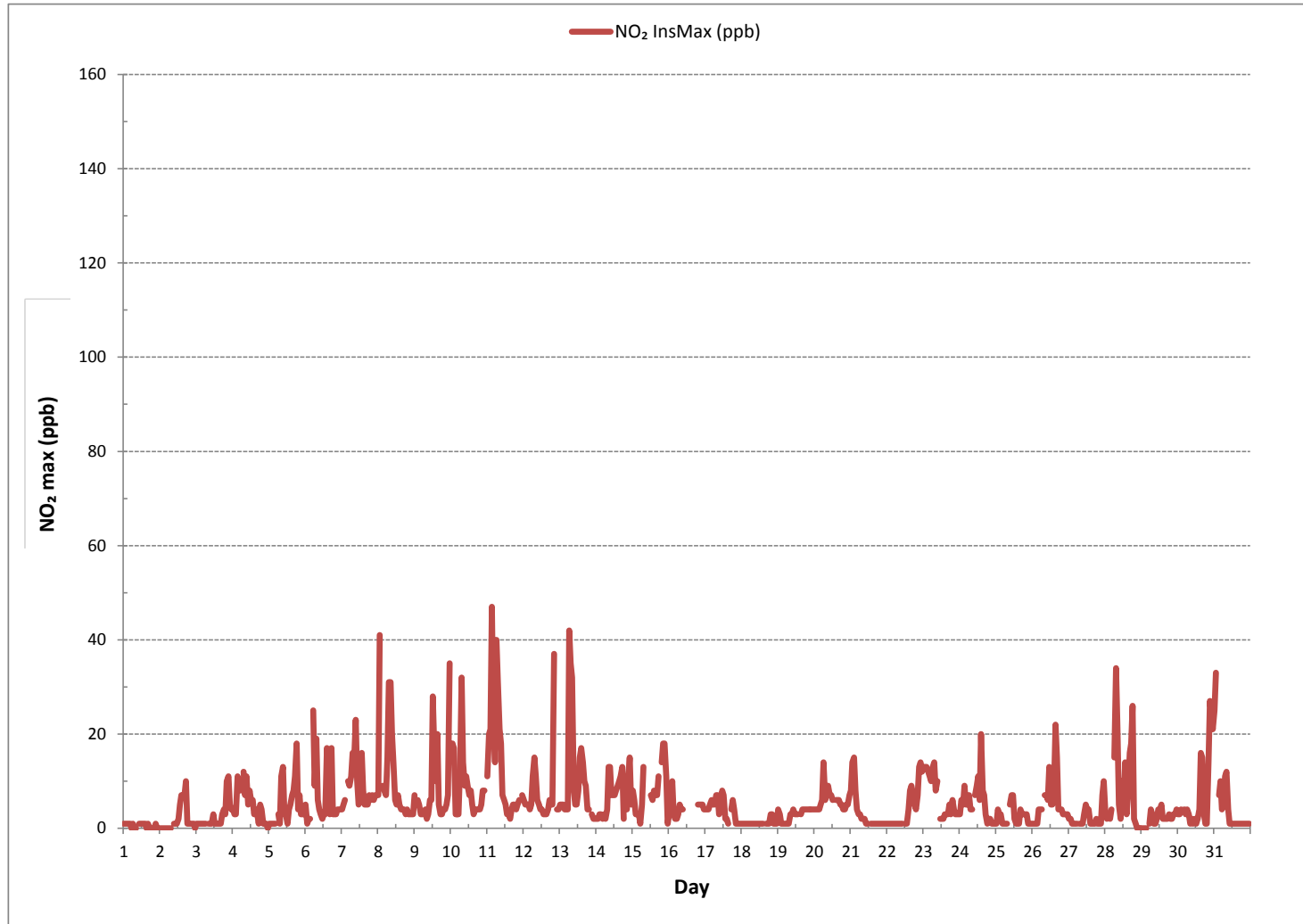
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	673
MAXIMUM INSTANTANEOUS VALUE:	47 ppb @ HOUR 3 ON DAY 11
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	9 hrs
OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	7

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	9.9	8.7	10.0	10.2	12.8	11.9	11.1	11.6	18.0	18.4	22.4	23.1	22.9	20.7	25.0	25.6	23.7	20.0	17.1	15.4	11.1	21.0	21.9	16.1	8.7	25.6	17.0	24	
2	15.9	13.6	12.1	10.7	13.8	14.0	11.1	13.7	17.6	20.6	30.5	29.2	34.9	33.0	35.6	38.1	39.0	25.7	26.4	24.5	21.8	18.1	22.2	20.1	10.7	39.0	22.6	24	
3	23.2	29.1	32.6	30.6	29.4	29.7	32.0	27.6	20.9	34.1	33.9	38.0	36.9	38.2	36.8	29.5	32.4	31.3	32.5	31.5	26.8	23.6	27.3	28.6	20.9	38.2	30.7	24	
4	27.2	24.2	25.1	26.7	27.0	23.4	18.0	17.1	19.8	20.0	16.1	18.4	16.8	16.8	14.8	13.7	10.2	6.8	10.0	5.4	14.6	19.2	23.3	17.6	5.4	27.2	18.0	24	
5	17.1	16.9	10.9	10.4	10.4	14.9	10.0	10.0	8.1	11.2	13.7	12.7	12.1	13.4	12.8	12.1	10.5	5.9	9.7	10.1	10.1	8.7	3.4	11.3	3.4	17.1	11.1	24	
6	12.0	12.7	16.1	11.1	10.1	11.1	10.2	11.0	14.3	10.8	14.4	21.1	20.6	23.1	25.9	21.8	16.4	12.9	18.5	13.3	13.7	15.0	11.1	11.3	10.1	25.9	14.9	24	
7	13.4	12.4	11.8	11.9	8.7	8.8	9.3	9.3	9.2	8.9	8.1	12.1	16.0	14.4	19.5	18.9	20.4	13.5	10.2	8.9	10.9	8.6	5.7	6.3	5.7	20.4	11.6	24	
8	5.9	6.0	9.4	4.3	2.9	2.1	5.3	5.4	4.3	4.3	13.4	15.5	12.8	17.5	16.6	15.2	14.3	12.9	11.9	12.2	16.7	22.0	17.0	21.3	2.1	22.0	11.2	24	
9	24.5	20.7	20.9	22.0	21.8	18.7	19.0	19.0	19.4	15.1	10.1	6.8	7.6	9.6	11.9	9.7	12.7	14.5	15.6	14.8	10.5	8.7	8.5	8.9	6.8	24.5	14.6	24	
10	9.1	9.7	10.6	7.2	4.8	4.8	10.8	15.4	14.5	12.2	13.3	17.4	18.6	19.1	19.2	22.0	18.6	16.6	13.0	12.2	11.8	11.2	9.9	9.2	4.8	22.0	13.0	24	
11	11.1	7.5	3.7	5.8	3.0	3.4	3.8	1.7	3.5	5.3	13.8	12.6	15.1	14.8	15.0	14.6	17.9	12.6	7.7	3.8	5.7	3.8	7.8	10.3	1.7	17.9	8.5	24	
12	6.8	4.0	5.1	7.3	9.4	6.9	2.9	4.4	9.4	13.2	15.5	18.0	27.4	26.4	24.6	26.3	25.2	17.7	8.0	7.2	11.1	10.7	11.9	13.9	2.9	27.4	13.1	24	
13	14.7	9.8	3.5	3.7	3.6	3.0	5.2	4.9	5.6	9.8	9.5	11.2	9.7	9.8	10.6	12.8	13.8	14.1	8.2	7.5	7.8	8.8	9.0	9.7	3.0	14.7	8.6	24	
14	9.2	11.4	10.6	11.4	10.1	8.6	11.1	9.9	21.2	29.5	31.7	28.6	24.6	26.4	26.5	27.2	29.4	24.7	22.0	20.4	19.9	23.9	22.4	20.0	8.6	31.7	20.0	24	
15	14.2	11.4	10.6	12.5	5.7	7.2	8.4	14.2	19.1	22.7	18.5	24.9	22.4	23.5	24.1	20.1	25.8	24.5	18.8	16.1	17.0	15.3	17.3	11.0	5.7	25.8	16.9	24	
16	9.8	14.9	14.2	11.3	7.4	11.5	8.8	7.8	6.8	10.5	11.7	12.4	12.0	14.6	15.1	15.7	16.2	12.8	6.6	3.9	3.0	4.8	4.1	9.4	3.0	16.2	10.2	24	
17	6.9	5.2	7.2	7.2	5.7	4.4	4.5	3.4	5.4	12.2	13.1	13.0	16.8	17.6	16.8	16.0	12.8	11.7	8.8	21.1	24.8	23.7	21.2	21.0	3.4	24.8	12.5	24	
18	19.7	24.6	28.3	27.5	24.4	17.9	22.0	22.7	22.0	21.6	21.8	17.4	15.2	16.3	16.1	12.2	11.3	10.3	7.9	7.5	7.1	9.3	14.0	6.7	6.7	28.3	16.8	24	
19	5.2	10.0	10.2	5.2	5.0	5.4	7.3	6.5	9.9	12.9	14.3	16.3	14.9	17.4	20.8	21.9	20.3	20.1	14.6	14.5	14.0	17.7	18.0	14.9	5.0	21.9	13.2	24	
20	14.4	14.5	16.9	12.1	8.9	13.8	14.0	13.8	13.1	11.0	13.1	13.9	13.8	13.9	17.8	19.3	15.0	16.0	13.3	9.7	8.5	8.2	9.5	9.6	8.2	19.3	13.1	24	
21	8.3	4.4	3.6	8.9	11.8	17.9	16.4	19.9	22.5	23.0	23.9	21.0	24.4	25.6	26.2	27.5	24.0	26.0	28.0	25.3	23.5	26.5	21.2	21.7	3.6	28.0	20.1	24	
22	19.3	24.2	23.3	24.5	23.3	21.5	23.1	27.8	32.0	28.2	24.6	25.6	25.7	29.2	37.4	43.0	39.5	38.4	41.9	41.6	38.6	39.4	36.8	39.9	19.3	43.0	31.2	24	
23	39.6	37.4	44.4	36.8	48.1	42.4	40.4	47.5	35.9	31.1	33.6	25.9	29.5	28.7	25.5	19.8	16.4	14.7	13.4	11.7	9.2	7.2	2.9	5.3	2.9	48.1	27.0	24	
24	6.7	8.2	9.5	17.8	18.8	15.3	12.9	13.7	17.6	13.7	15.6	10.7	14.5	18.6	19.7	17.0	15.1	19.3	13.5	11.9	15.2	15.4	12.7	12.7	6.7	19.7	14.4	24	
25	15.0	21.9	13.7	10.2	3.7	5.4	11.8	9.6	11.8	14.4	11.5	14.7	12.8	11.0	15.7	14.4	10.7	10.2	4.9	8.1	7.8	9.2	10.1	11.9	3.7	21.9	11.3	24	
26	12.6	10.5	7.7	8.2	6.3	7.4	17.0	16.5	14.6	14.8	16.3	16.9	16.4	15.2	18.5	29.4	32.0	25.7	25.5	28.1	29.1	27.4	22.4	20.4	6.3	32.0	18.3	24	
27	10.3	13.2	17.5	14.3	16.5	22.8	19.5	18.1	18.2	23.7	30.9	24.2	24.5	20.6	19.8	16.8	16.2	15.2	13.6	7.1	3.0	4.2	5.0	6.5	3.0	30.9	15.9	24	
28	6.8	6.2	5.0	4.0	6.2	8.0	9.6	8.1	14.2	15.0	27.1	24.7	32.4	28.4	22.8	32.9	29.4	35.8	27.9	22.9	27.1	36.3	26.7	25.9	4.0	36.3	20.1	24	
29	16.7	15.5	15.5	15.7	6.9	4.0	4.8	14.0	14.2	12.0	11.7	14.2	15.1	22.6	23.9	25.6	25.1	18.9	13.8	9.0	7.1	3.2	3.3	2.9	2.9	25.6	13.2	24	
30	3.6	3.6	4.3	5.5	5.9	8.0	3.3	14.8	23.5	23.2	23.5	28.4	33.2	31.5	31.2	27.9	26.9	29.5	32.0	23.8	11.7	19.7	21.3	17.2	3.3	33.2	18.9	24	
31	20.5	22.2	19.6	17.9	19.0	19.5	22.9	23.8	25.6	27.8	31.6	35.4	35.3	38.5	37.0	36.2	35.0	31.7	26.3	21.5	20.4	17.6	14.3	21.8	14.3	38.5	25.9	24	
HOURLY MAX	39.6	37.4	44.4	36.8	48.1	42.4	40.4	47.5	35.9	34.1	33.9	38.0	36.9	38.5	37.4	43.0	39.5	38.4	41.9	41.6	38.6	39.4	36.8	39.9					
HOURLY AVG	13.9	14.0	14.0	13.3	12.6	12.7	13.1	14.3	15.9	17.1	19.0	19.5	20.5	21.2	22.0	22.0	21.2	19.0	16.8	15.2	14.8	15.8	14.9	14.9					

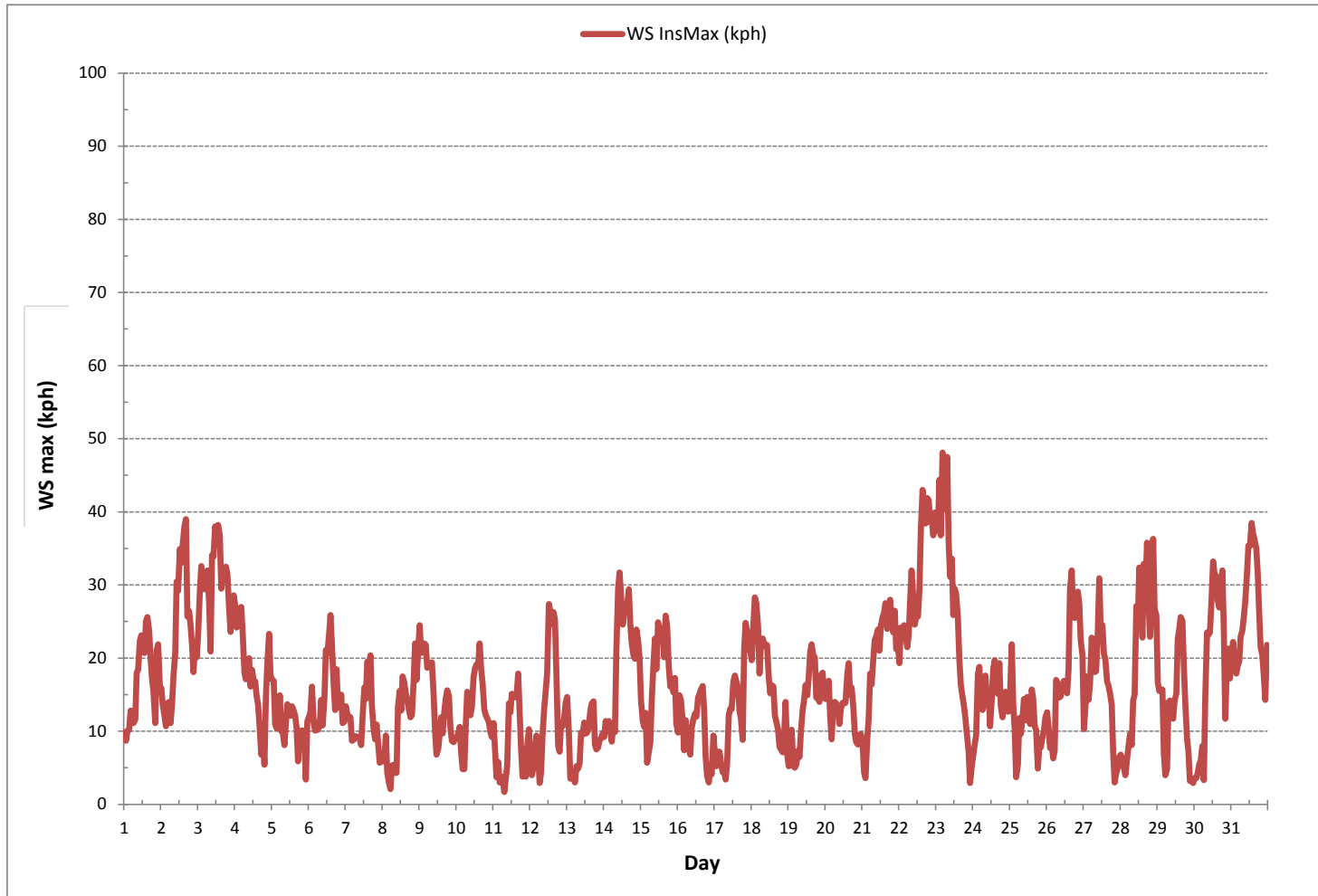
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	48.1	kph	@ HOUR	4	ON DAY	23	
OPERATIONAL TIME:						744	hrs

WIND SPEED Instantaneous Maximum (WS kph)



APPENDIX V
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION	MASKWA CONTINUOUS MONITORING STATION
Name of the Representative of the Person Responsible	Position / Title of the Representative of the Person Responsible
Mike Bisaga	Environment Monitoring Program Manager
Is an External Party Certifying the Report?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Name of External Person Certifying the Report	Position / Title of External Person Certifying the Report
Wunmi Adekanmbi	Project Manager, Customer Service, Air Services
Company Name for External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
Maxxam Analytics, A Bureau Veritas Group Company	M.Sc., EPT.

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.



Signature of the External Person Certifying the Report

26-April-2018

Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-03-30-C</u>
Site: <u>Maskwa Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghalet</u>	Date <u>April 11, 2017</u>
Level 1 Primary Validation	<u>Maram Ghalet</u>	Date <u>April 11, 2017</u>
Level 2 Final Validation	<u>Maram Ghalet</u>	Date <u>April 25, 2017</u>
Level 3 Independent Data Review	<u>CSA-LMBQ</u>	Date <u>April 26, 2017</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.

Alberta Environment and Parks (AEP)
Air.Reporting@gov.ab.ca

May 2, 2018

Subject: Monthly Report Submission for the LICA St. Lina station

Lakeland Industry & Community Association (LICA) is pleased to submit the ambient air monitoring monthly report for the LICA St. Lina AQM Station in the month of March 2018.

The air monitoring program consists of continuous air monitoring results for Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

Sampling Program	Monitoring Activities Conducted By	Sample Analysis Conducted By	Data/Report Review and Prepared By	Electronic Submission Conducted By
Continuous ambient air	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics	Maxxam Analytics

All data collected in March 2018 was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement systems.

THC: The LICA-owned Thermo 51C, s/n: 436609739, analyzer was removed for maintenance to address the negative drift and instability in zero response that occurred during the February monitoring period on March 5. A Maxxam-supplied Thermo 51i, s/n: 925436893, analyzer was installed on March 6. Nineteen hours of downtime were recorded due to this event.

NO_x/NO/NO₂: The LICA-owned API 200E, s/n: 594, analyzer was removed for maintenance to address an instability in span response On February 28. A Maxxam-supplied API 200A, s/n: 1746, analyzer was installed on March 1. Eleven hours of downtime were recorded in March due to this event.

A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in this monthly report.

As the LICA Environmental Program Manager and Data & Reporting Specialist, we have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements. We also verify all air data that are required by the AMD to be electronically submitted to AEP and Alberta's Ambient Air Quality Data Warehouse have been submitted by the time of this report submission.



Lakeland Industry & Community Association
5107 50 St
Bonnyville, AB T9N 2J7

Should you have any questions, please don't hesitate to contact us.

Respectfully,

A handwritten signature in blue ink that reads "Michael Bisaga". The signature is written in a cursive style with a large, prominent initial "M".

Michael Bisaga
Technical Program Manager
Lakeland Industry & Community Association
780-266-7068
mbisaga@otonabee.ca

A handwritten signature in blue ink that reads "Lily Lin". The signature is written in a cursive style with a large, prominent initial "L".

Lily Lin
Data & Reporting Specialist
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AMBIENT AIR MONITORING MONTHLY DATA REPORT
LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
ST. LINA CONTINUOUS MONITORING STATION

JOB #: 2833-2018-03-31-C

March 2018

Prepared for:

LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
5107 50 ST.
BONNYVILLE, ALBERTA
T9N 2J7

Attention: MIKE BISAGA

DATE: **April 27, 2018**

Prepared by: *Maram Ghaleb*

Maram Ghaleb, B.Sc.
Project Manager, Customer Service, Air Services

Reviewed by: *Wunmi Adekanmbi*

Wunmi Adekanmbi, M.Sc., EPT, PMP
Project Manager, Customer Service, Air Services

SUMMARY

In March 2018, Maxxam Analytics was contracted to manage the ambient air quality monitoring and maintenance activities at the St. Lina Continuous Monitoring Station, near Bonnyville, Alberta. The monitoring station provides continuous meteorological measurements and air quality data for non-compliance parameters, as requested by the Lakeland Industry and Community Association.

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

THC: On March 5, LICA's analyzer, Thermo 51C (s/n: 436609739), was removed for maintenance to address the negative drift and instability in zero response that occurred during the February monitoring period. A replacement supplied by Maxxam, Thermo 51i (s/n: 925436893), was installed on March 6. Nineteen hours of downtime were recorded due to this event.

NO_x/NO/NO₂: On February 28, LICA's analyzer, API 200E (s/n: 594), was removed for maintenance to address an instability in span response. A replacement supplied by Maxxam, API 200A (s/n: 1746), was installed on March 1. Eleven hours of downtime were recorded in March due to this event.

A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.

The summary of results is presented on the following pages.

Any deviations or modifications made to the sampling or analytical methods are outlined in Section 1.0, Discussion. On this basis, Maxxam Analytics is issuing this completed report to Lakeland Industry & Community Association, St. Lina Continuous Monitoring Station.

Should you have any questions concerning the results or if we can be of further assistance, please contact us at 403-219-3677 or toll-free at 1-800-386-7247.

Monthly Continuous Data Summary

Lakeland Industry & Community Association						MAXIMUM VALUES							OPERATIONAL TIME (%)
St. Lina Continuous Monitoring Station						1-HOUR				24-HOUR			
PARAMETER	OBJECTIVES		EXCEEDANCES		MONTHLY AVERAGE	READING	DAY	HOUR	WIND SPEED (kph)	WIND DIRECTION (sector)	READING	DAY	
	1-hr	24-hr	1-hr	24-hr									
SO ₂ (ppb)	172	48	0	0	0	5	7	17	7.6	SSW	2	7	100.0
H ₂ S (ppb)	10	3	0	0	0	0	1	0	12.0	ENE	0	1	100.0
THC (ppm)	-	-	-	-	2.30	3.29	14	0	11.1	ESE	2.69	8	97.4
NO ₂ (ppb)	159	-	0	-	1	8	8	14	9.7	ESE	5	8	98.5
NO (ppb)	-	-	-	-	0	4	8	8	9.7	ESE	1	7	98.5
NO _x (ppb)	-	-	-	-	2	12	8	14	9.7	ESE	6	8	98.5
O ₃ (ppb)	82	-	0	-	43.9	68.1	13	16	6.2	E	57.2	14	100.0
PM _{2.5} (µg/m ³)	80	30	0	0	7	24	20	9	6.6	SW	15	13	100.0
RELATIVE HUMIDITY (%)	-	-	-	-	66	87	23	14	12.9	SSE	82	23	100.0
BAROMETRIC PRESSURE (millibar)	-	-	-	-	928	941	11	13	5.9	SW	937	31	100.0
AMBIENT TEMPERATURE (°C)	-	-	-	-	-6.7	7.3	20	13	5.6	SW	-0.5	11	100.0
PRECIPITATION (mm)	-	-	-	-	0.0	0.8	4	13	5.4	SSW	0.2	3	100.0
VECTOR WS (kph)	-	-	-	-	3.4	33.9	23	1	-	ESE	21.0	22	100.0
VECTOR WD (sec)	-	-	-	-	117 (ESE)	-	-	-	-	-	-	-	100.0

Exceedance Summary Report

SO₂ 1-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 1-hour AAAQO of 172 ppb.

SO₂ 24-Hour Exceedances

Measured concentrations of sulphur dioxide were below the 24-hour AAAQO of 48.0 ppb.

H₂S 1-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 1-hour AAAQO of 10 ppb.

H₂S 24-Hour Exceedances

Measured concentrations of hydrogen sulphide were below the 24-hour AAAQO of 3 ppb.

NO₂ 1-Hour Exceedances

Measured concentrations of nitrogen dioxide were below the 1-hour AAAQO of 159 ppb.

PM_{2.5} 1-Hour Exceedances

Measured concentrations of fine particulate matter were below the 1-hour AAAQO of 80 µg/m³.

PM_{2.5} 24-Hour Exceedances

Measured concentrations of fine particulate matter were below the 24-hour AAAQO of 30 µg/m³.

O₃ 1-Hour Exceedances

Measured concentrations of ozone were below the 1-hour AAAQO of 82 ppb.

In accordance with EPEA and the Substance Release Regulation.

In accordance with A Guide to Release Reporting and the Alberta Ambient Air Quality Objectives and Guidelines Summary.

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1.0 Discussion

This monthly report consists of continuous monitoring results for the following parameters: Sulphur Dioxide (SO₂), Hydrogen Sulphide (H₂S), Total Hydrocarbon (THC), Oxides of Nitrogen (NO_x), Nitric Oxides (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matter 2.5 (PM_{2.5}), Relative Humidity (RH), Barometric Pressure (BP), Precipitation, Ambient Temperature (AmbTPX), Wind Speed (WS), Wind Direction (WD) and Standard Deviation Wind Direction (STDWD).

The sample inlet filter for all continuous air analyzers are replaced before the calibration begins. The sample manifold is cleaned during the site visit each month.

Control checks, consisting of a zero and span, are conducted daily on all continuous air monitors. In place of the air sample, zero air (from scrubbed air or gas cylinders) is used for zero checks, and a known concentration of the pollutant being analyzed is used for span checks. These checks are controlled by automatic timers and valves. The total zero span cycle is completed within an hour, the commencement of the zero span cycle is at the beginning of the hour.

Multipoint calibrations are done a minimum of once a month for each continuous air monitor. An additional calibration is required under the following conditions: 1) within three days after the initial start-up and stabilization of a newly installed instrument, 2) prior to shut-down or moving of an instrument which has been working to specification, and 3) when major repair has been done on the instrument.

Time during the first multi-point calibration is not considered downtime (Data is flagged as C). If more than one calibration is performed during the month, the time during the additional calibration is considered as downtime (Data is flagged as C1).

Only one zero/span check is run per day. Time during the zero/span check is not considered as downtime (Data is flagged as S). If an extra zero/span check is performed, the time during the additional check is considered as downtime (Data is flagged as S1).

The AMD requires each instrument and accompanying data recording system to be operational 90% of the time, at a minimum, for each monthly monitoring period.

All sampling, analysis, and QA/QC for this project was performed by Maxxam Analytics and complies with the Alberta Air Monitoring Directive.

Data contained in this monthly report has undergone the verification and validation based on the requirements of the AMD Chapter 6: Ambient Data Quality (December, 2016). The descriptions of the data verification and validation process can be found in Section 5 of this report. Instantaneous data, where applicable, is provided for reference purposes and has not undergone zero correction. The minimum and maximum statistics are highlighted in the data table and are for reference only. The highlighted cells are based on the software's interpretation of the exact position of the minimum or maximum value. The visual presentation of these statistics may not be the obvious choice in a data range due to rounding, truncating or analyzer specifications.

Hourly/minute data have been reviewed based on daily zero/span results and multi-point calibration results. Data may be considered invalid if a zero-corrected span check in excess of +/- 10% of the span concentration (established by the previous multi-point calibration) is encountered and/or significant differences in the calibration factor occurs (greater than 10%).

SULPHUR DIOXIDE (SO₂)

- Operational time for the monitoring period was 100%.
- The Ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the SO₂ channel on March 1 at hour 15:00, due to activities on the Ozone channel.
- Following a successful shut-down calibration on March 2, an analog output calibration was completed and the sample pump was rebuilt. A post-repair calibration was successfully completed afterwards. This event did not incur any downtime hours.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.
- One instance of maximum instantaneous data was discarded on March 29 at hour 13:00, due to a brief power outage.

HYDROGEN SULPHIDE (H₂S)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on March 5.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.
- One instance of maximum instantaneous data was discarded on March 29 at hour 13:00, due to a brief power outage.

TOTAL HYDROCARBONS (THC)

- Operational time for the monitoring period was 97.4 %, equivalent to 19 hours of downtime.
- Following a successful shut-down calibration on March 5, the LICA-owned analyzer, Thermo 51C (s/n: 436609739) was removed for maintenance. This was to address the negative drift and instability in zero response that occurred during the February monitoring period. The installation calibration for the Maxxam-supplied replacement analyzer, Thermo 51i (s/n: 925436893), was completed on March 6, after the analyzer had been left offline to stabilize overnight. Nineteen hours of downtime were incurred due to this event.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.
- A brief power outage that occurred on March 29 at hour 13:00 interfered with the THC zero-span program. As a result, the scheduled zero-span check did not automatically execute at 04:00 on March 30. A zero-span check was manually triggered successfully at 09:00 on the same day. One instance of maximum instantaneous data was discarded due to the brief power outage.

OXIDES OF NITROGEN (NO_x), NITRIC OXIDE (NO) and NITROGEN DIOXIDE (NO₂)

- Operational time for the monitoring period was 98.5 %, equivalent to 11 hours of downtime.
- Following a successful shut-down calibration on February 28, the LICA-owned analyzer (API 200E, s/n: 594) was removed for maintenance. This was to address the instability in span response that occurred towards the end of the February monitoring period. The installation calibration for the Maxxam-supplied replacement analyzer (API 200A, s/n: 1746) was completed on March 1, after the analyzer had been left offline to stabilize overnight. Eleven hours of downtime were incurred in March due to this event.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.
- One instance of maximum instantaneous data was discarded on March 29 at hour 13:00, due to a brief power outage.

OZONE (O₃)

- Operational time for the monitoring period was 100%.
- The routine monthly calibration was performed on March 1.
- The Ozone and SO₂ span programs are designed to run concurrently. An additional quality check was recorded on the Ozone channel on March 2 at hours 16:00 - 17:00 due to activities on the SO₂ channel.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.
- One instance of maximum instantaneous data was discarded on March 29 at hour 13:00, due to a brief power outage.

PARTICULATE MATTER < 2.5 MICRONS (PM_{2.5})

- Operational time for the monitoring period was 100%.
- The routine monthly audit was performed on March 6.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.

WIND SPEED (WS), WIND DIRECTION (WD) and STANDARD DEVIATION WIND DIRECTION (STDWD)

- Operational time for the monitoring period was 100%
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.
- One instance of maximum instantaneous data was discarded on March 29 at hour 13:00, due to a brief power outage.
- Wind data is reported as vector wind speed and vector wind direction. Wind direction is defined as the direction from which the wind is blowing and is measured in degrees from true north.

RELATIVE HUMIDITY (RH)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.

BAROMETRIC PRESSURE (BP)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.

PRECIPITATION (PRECIP)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.

AMBIENT TEMPERATURE (AmbTPX)

- Operational time for the monitoring period was 100%.
- A station audit was conducted by Alberta Environment and Parks (AEP) on March 13. The Audit report can be found in Appendix III.

2.0 Project Personnel

Mike Bisaga and Lily Lin were the contacts for Lakeland Industry & Community Association and the Maxxam field technician was Alexander Yakupov.

3.0 Plant Monthly Required AMD Summary

All data collected this month was compliant with the requirements outlined in the Air Monitoring Directive (Alberta Environment and Parks, 2016).

The operational time for all continuous ambient air analyzers, meteorological systems and data acquisition systems were above the 90% requirement.

4.0 Calculations and Results

All calculations and reporting of results follow the methods described in the AMD, 2016.

5.0 Methods and Procedures

The following methods and procedures were used to complete the monitoring program:

Maxxam AIR SOP-00014: Measurement of Particulate Concentration Using the THERMO SHARP
Maxxam AIR SOP-00209: Ambient Sulphur Monitoring
Maxxam AIR SOP-00212: Ambient O₃ Monitoring
Maxxam AIR SOP-00213: Ambient NO/NO₂/NO_x Monitoring
Maxxam AIR SOP-00214: Ambient Hydrocarbon (THC) Monitoring
Maxxam AIR SOP-00242: Precipitation Collector Installation/Maintenance
MET One Instruments: Operation Manual Document No. 50.5-9800

There were no deviations from the prescribed methods.

The following instruments were used to perform the test program:

Sulphur Dioxide - API 100E UV Fluorescent Analyzer
Hydrogen Sulphide - API 101E UV Fluorescent Analyzer
Total Hydrocarbons - Thermo 51i and 51C FID Analyzer
Oxides of Nitrogen - API 200A Chemiluminescent Analyzer
Ozone - Thermo 49i Photometric Analyzer
Particulate Matter (PM_{2.5}) - Thermo SHARP 5030i Unit
Wind System - Met One Unit
Relative Humidity - Met One Unit
Barometric Pressure - Met One Unit
Ambient Temperature - Met One Unit
Precipitation - Met One Unit
Datalogger - ESC 8832

The following steps were used to complete the data verification and validation process:

Level 0 Preliminary Verification

Level 0 data are raw data obtained directly from the data acquisition system (DAS). Under the step of Level 0, these data undergo a certain amount of manual or automated screening and flagging. It included a) identification of periods of missing data; b) verification of time stamps against reference time; c) verification that instrument diagnostics/datalogger flags indicate normal operation; d) comparison of data to upper and lower limits; e) rate of change flagging indicating that data changed too rapidly or not at all; and f) verification that zero, span and multipoint performance checks are within specifications. This level of verification is performed on a daily basis.

Level 1 Primary Validation

Validation actions under the step of Level 1 include a) review of all screening flags assigned during preliminary verification; b) review of all supporting site information and documentation; c) review of operational acceptance limits for each parameter/analyzer; d) review of daily zero/span and monthly calibration results for all gaseous parameters; and e) application of any necessary adjustments to data (e.g. baseline adjustments, below zero adjustments). This level of validation is performed on a monthly basis.

Level 2 Final Validation

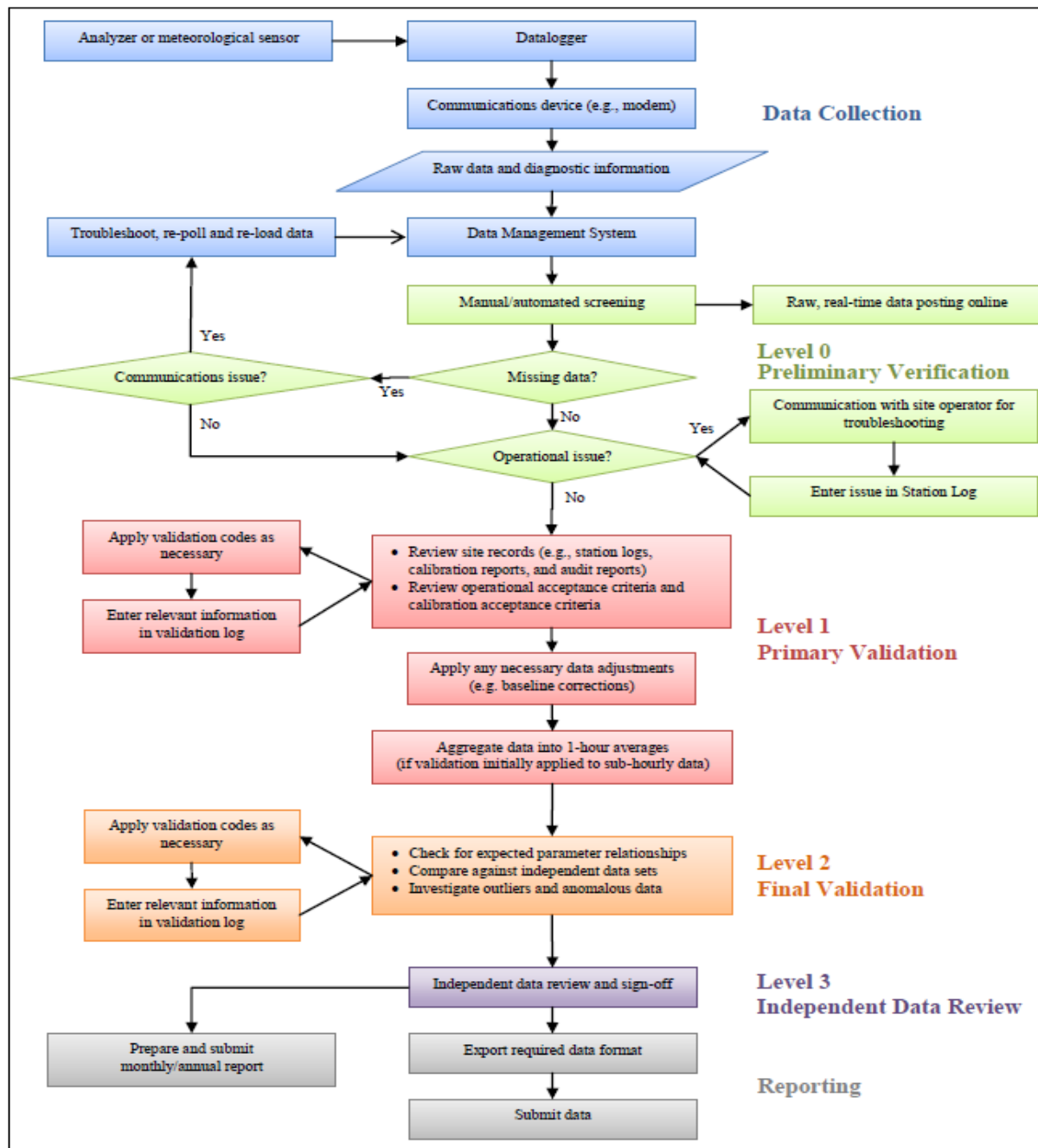
The purpose of Level 2 validation is to verify that there are no inconsistencies among related data, or among regional data measured at nearby sites.

Level 3 Independent Data Review

Level 3 validation is the last step of data review, and it is completed by an individual that is independent of both field operations and primary data validation. A final independent QA review and endorsement is performed during this step before data is submitted to Alberta Environment.

Post-Final Validation

The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. Any data issues or patterns which were not clear on a monthly basis are highlighted during this step. This validation is performed on an annual basis.



Source: Air Monitoring Directive (December 2016), Chapter 6, Ambient Data Quality; Figure 1 Data Collection and Management Process Flow Chart

APPENDIX I
CONTINUOUS MONITORING DATA RESULTS

SULPHUR DIOXIDE

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0	0	Q	0	0	0	0	0	0	0	0	0	0	1	0	24		
2	0	0	0	0	0	0	0	0	0	0	0	S	0	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	24	
3	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
4	0	0	0	0	0	0	0	0	S	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	24	
5	1	1	1	1	1	1	S	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	0	2	1	1	24		
6	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	0	24		
7	1	1	1	1	S	1	1	1	1	1	1	1	1	1	2	3	4	S	2	2	1	1	1	1	1	1	5	2	2	24		
8	1	1	2	S	1	1	1	1	1	2	2	2	3	3	2	2	3	1	1	2	2	1	1	1	1	1	3	2	1	24		
9	0	0	S	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	1	1	24			
10	0	S	0	0	0	0	0	1	1	1	1	0	0	0	1	1	0	1	0	0	1	2	2	2	0	2	1	2	24			
11	S	3	2	2	2	2	2	2	2	2	2	2	1	3	1	1	1	2	2	1	1	1	1	S	1	3	2	2	24			
12	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	1	0	1	24			
13	0	0	0	0	0	0	0	0	0	0	0	Q	Q	Q	0	0	1	0	1	1	1	1	S	3	1	0	3	0	24			
14	1	1	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	1	0	1	24		
15	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	0	0	0	0	0	0	1	1	1	24		
16	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	S	1	0	0	0	0	0	0	1	0	1	24		
17	0	0	0	1	1	1	1	1	1	0	0	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	1	0	1	24		
18	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	1	24		
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
20	0	0	0	1	1	1	1	1	1	1	1	1	0	0	S	0	0	1	1	2	2	2	1	1	1	0	2	1	2	24		
21	1	1	1	1	1	1	1	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	24		
22	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	24		
23	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
24	0	0	0	1	1	1	0	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	24		
25	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
26	0	0	1	1	1	0	0	0	S	0	1	2	2	1	1	0	0	0	0	0	0	0	1	2	0	0	2	1	2	24		
27	1	1	2	2	1	0	0	S	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	2	24		
28	0	0	0	0	0	0	S	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	1	0	0	1	0	1	24		
29	1	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	24		
30	0	0	1	0	S	0	0	1	1	1	1	1	2	1	1	1	2	1	1	0	0	0	0	0	0	0	2	1	2	24		
31	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	2	0	2	24		
HOURLY MAX	1	3	2	2	2	2	1	2	2	2	2	2	3	3	3	3	4	5	2	2	2	2	3	2	0	2	2	0	24			
HOURLY AVG	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	0	1	1	0	0	0	0	1	0	0	0	0	0	24			

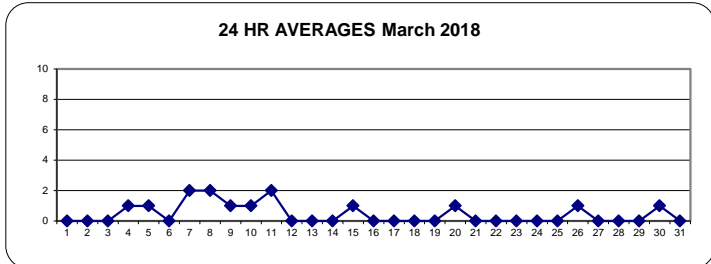
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	172	ppb	24-HR	48	ppb
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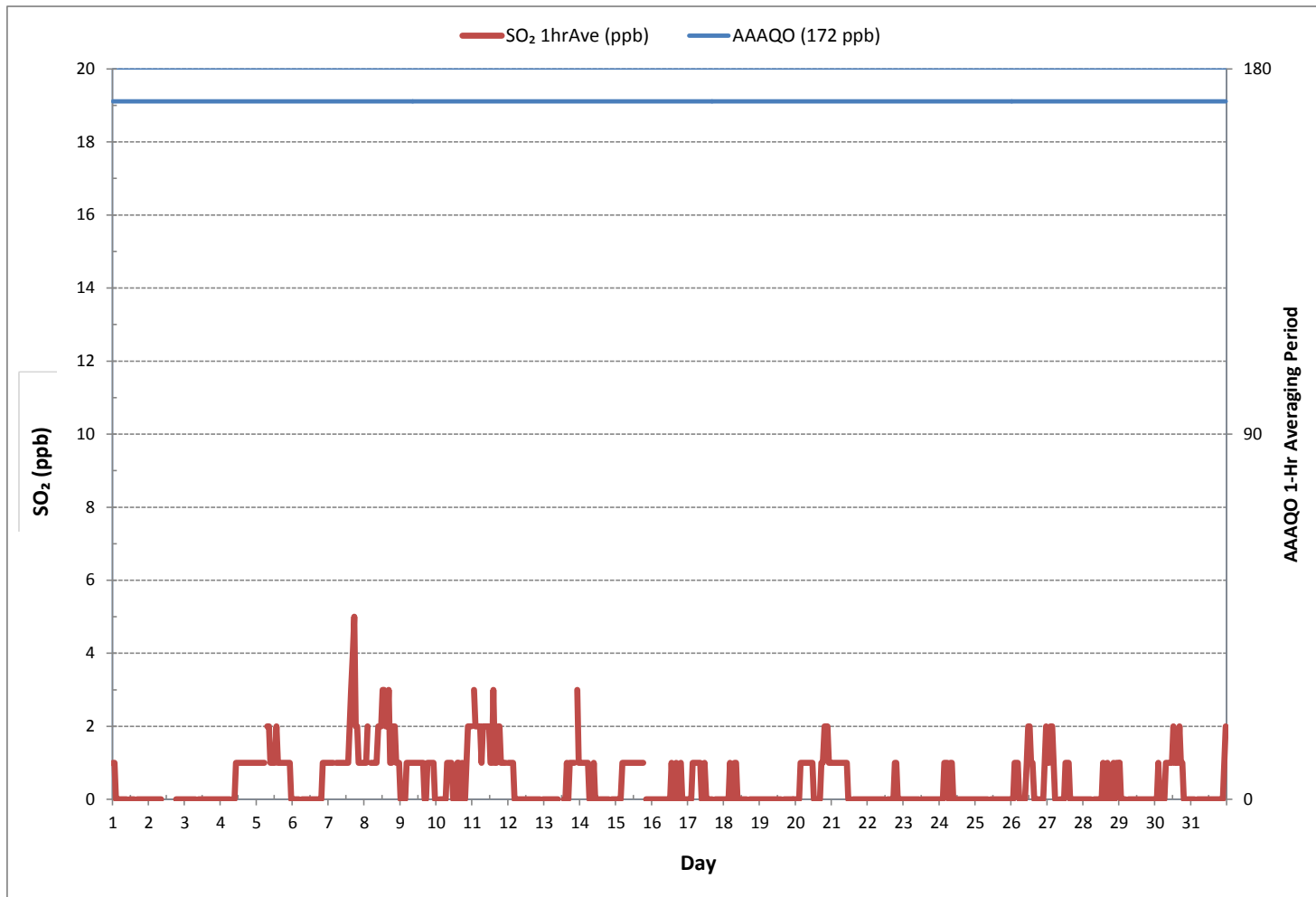
24 HR AVERAGES March 2018



MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0
NUMBER OF 24-HR EXCEEDANCES:	0
NUMBER OF NON-ZERO READINGS:	257
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 2 ON DAY 1
MAXIMUM 1-HR AVERAGE:	5 ppb @ HOUR 17 ON DAY 7
MAXIMUM 24-HR AVERAGE:	2 ppb ON DAY 7
IZS CALIBRATION TIME:	32 hrs
OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	7 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	1
MONTHLY AVERAGE:	0 ppb

SULPHUR DIOXIDE Hourly Averages (SO₂ ppb)









Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-SO2[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

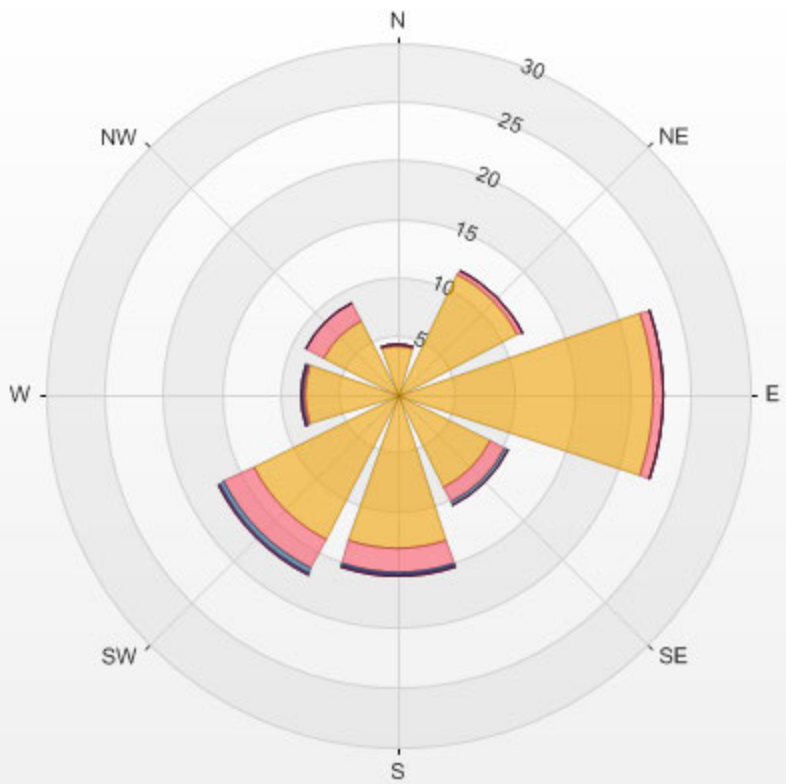
Calm: 0.86%

Calm Avg: 0.51 [ppb]

Direction	0.0-1.2	1.2-2.4	2.4-3.6	3.6-4.8	4.8-6.0	>6.0	Total
N	4.2	0.1	0.0	0.0	0.0	0.0	4.3
NE	11.4	0.4	0.0	0.0	0.0	0.0	11.9
E	21.9	0.7	0.1	0.0	0.0	0.0	22.8
SE	8.9	1.3	0.4	0.0	0.0	0.0	10.6
S	13.2	2.0	0.1	0.1	0.0	0.0	15.4
SW	13.7	2.9	0.4	0.1	0.0	0.0	17.2
W	7.9	0.3	0.1	0.0	0.0	0.0	8.3
NW	7.2	1.6	0.0	0.0	0.0	0.0	8.7
Summary	88.3	9.3	1.3	0.3	0.0	0.0	99.1

% Icon	Classes (ppb)	88		0.0-1.2	9		1.2-2.4	1		2.4-3.6	0		3.6-4.8	0		4.8-6.0	0		>6.0
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LICA ST. LINA Poll.: LICA ST. LINA-SO2[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 0.86% Calm Poll Avg: 0.51[ppb]



SO2[ppb] Calibration: LICA ST. LINA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



HYDROGEN SULPHIDE



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
2	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
3	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
4	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
5	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	24
6	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
7	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
8	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
9	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
10	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	24
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	24
13	0	0	0	0	0	0	0	0	0	0	Q	Q	Q	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	24
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	24
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	24
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	S	0	0	0	0	0	0	0	0	0	0	0	24
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	24
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
21	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
22	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
23	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
24	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
25	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
26	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
27	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
28	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
29	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
30	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
31	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
HOURLY MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
HOURLY AVG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

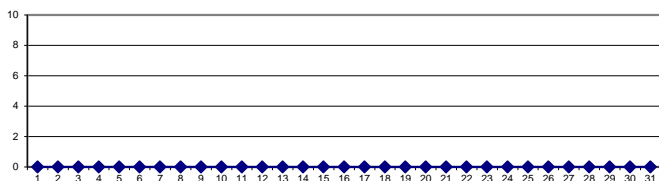
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	10	ppb	24-HR	3	ppb
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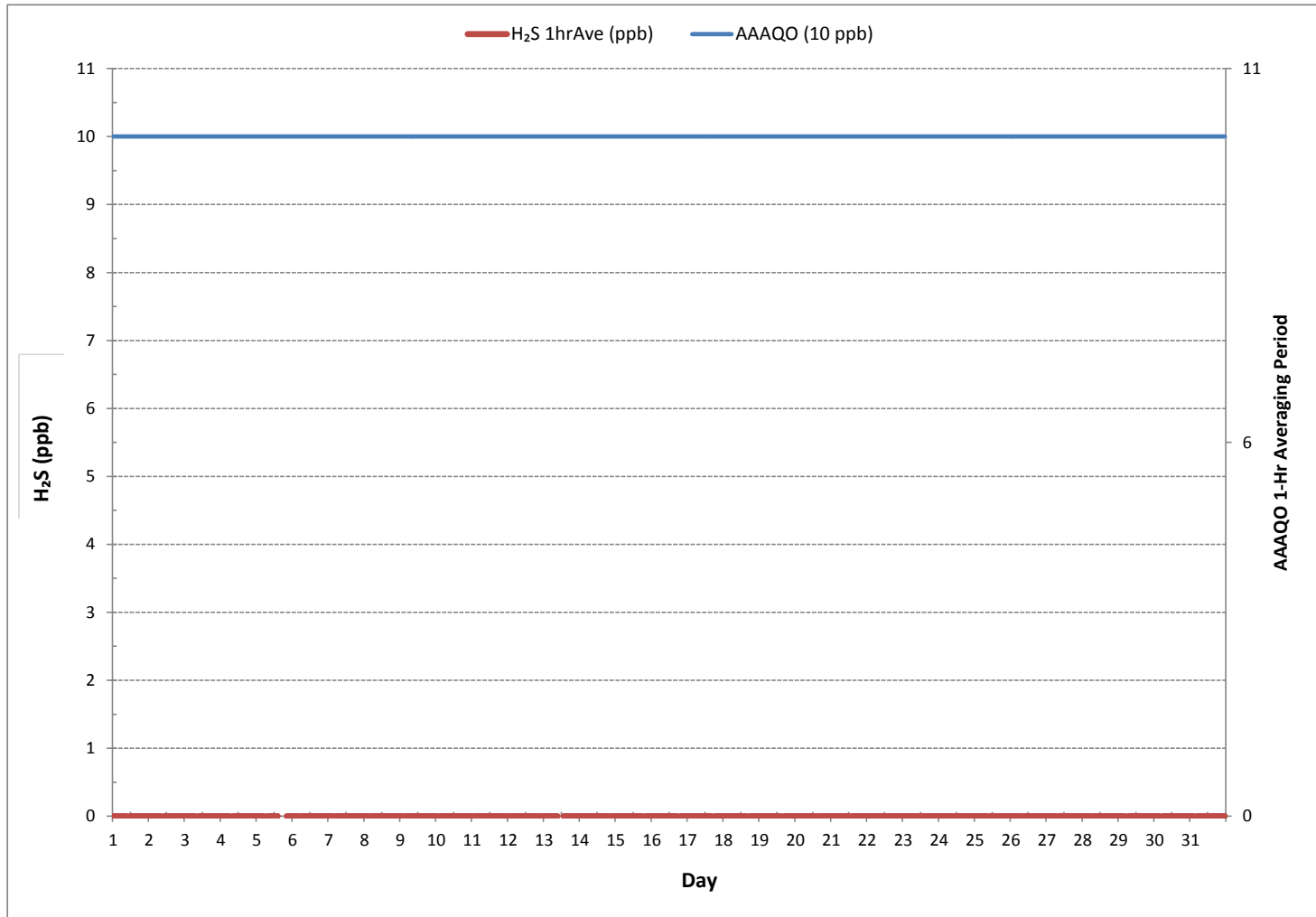
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	0		
MINIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1		
MAXIMUM 1-HR AVERAGE:	0 ppb @ HOUR 0 ON DAY 1		
MAXIMUM 24-HR AVERAGE:	0 ppb ON DAY 1		
IZS CALIBRATION TIME:	32 hrs	OPERATIONAL TIME:	744 hrs
MONTHLY CALIBRATION TIME:	5 hrs	AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	0	MONTHLY AVERAGE:	0 ppb

24 HR AVERAGES March 2018



HYDROGEN SULPHIDE Hourly Averages (H₂S ppb)



Wind: LICA ST. LINA
Poll.: LICA ST. LINA-H2S[ppb]
Monthly: 18/03
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

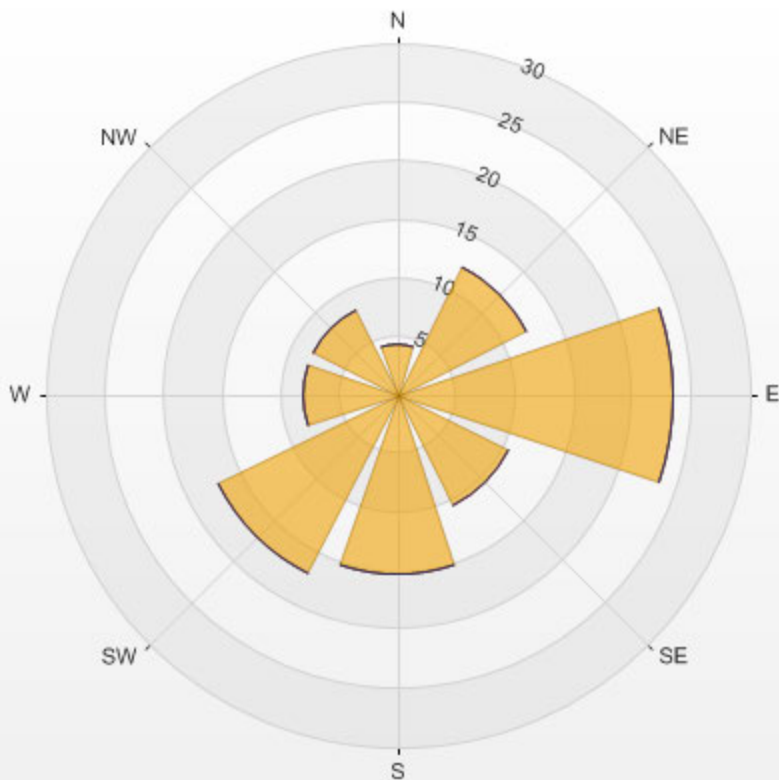
Calm: 0.85%

Calm Avg: 0.12 [ppb]

Direction	0.0-0.7	0.7-1.3	1.3-2.0	>2.0	Total
N	4.3	0.0	0.0	0.0	4.3
NE	12.2	0.0	0.0	0.0	12.2
E	23.5	0.0	0.0	0.0	23.5
SE	10.5	0.0	0.0	0.0	10.5
S	15.4	0.0	0.0	0.0	15.4
SW	17.1	0.0	0.0	0.0	17.1
W	8.1	0.0	0.0	0.0	8.1
NW	8.1	0.0	0.0	0.0	8.1
Summary	99.2	0.0	0.0	0.0	99.2

% Icon Classes (ppb) 99 0.0-0.7 0 0.7-1.3 0 1.3-2.0 0 >2.0

LICA ST. LINA Poll.: LICA ST. LINA-H2S[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 0.85% Calm Poll Avg: 0.12[ppb]



H2S[ppb] Calibration: LICA ST. LINA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



TOTAL HYDROCARBON

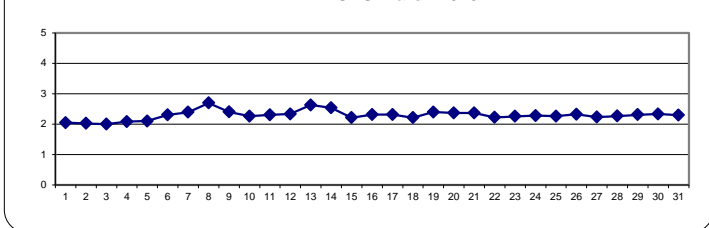
TOTAL HYDROCARBONS Hourly Averages (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	2.13	2.17	2.13	2.12	2.08	2.06	2.05	2.06	2.02	2.01	S	2.04	2.05	2.03	2.02	2.02	2.04	2.00	1.99	1.99	2.02	2.02	2.03	2.05	1.99	2.17	2.05	24	
2	2.05	2.03	2.02	2.02	1.98	2.01	2.01	1.99	2.00	S	2.03	2.02	2.06	2.05	2.05	2.09	2.11	2.11	2.08	2.06	2.03	1.96	1.92	1.93	1.92	2.11	2.03	24	
3	1.96	1.95	1.98	1.96	1.98	2.01	2.02	2.02	S	2.00	2.02	2.01	1.97	1.99	1.98	2.01	2.01	2.01	2.02	2.02	2.02	2.02	2.04	2.05	1.95	2.05	2.00	24	
4	2.05	2.05	2.04	2.03	2.02	2.04	2.03	S	2.08	2.10	2.11	2.11	2.10	2.10	2.10	2.11	2.10	2.10	2.11	2.12	2.10	2.09	2.11	2.09	2.02	2.12	2.08	24	
5	2.09	2.08	2.09	2.08	2.09	S	2.09	2.09	2.09	2.11	2.10	2.21	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	2.08	2.21	2.10	15	
6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	2.23	2.29	2.29	2.29	2.31	2.31	2.31	2.33	2.33	2.35	2.23	2.35	2.30	14	
7	2.38	2.40	2.42	2.41	S	2.41	2.44	2.45	2.47	2.43	2.35	2.32	2.29	2.33	2.36	2.39	2.40	2.37	2.37	2.36	2.39	2.40	2.40	2.44	2.29	2.47	2.39	24	
8	2.44	2.50	2.48	S	2.52	2.51	2.62	2.65	2.66	2.54	2.45	2.43	2.42	2.55	3.11	3.07	2.70	2.70	3.04	2.95	2.97	2.83	2.90	2.93	2.42	3.11	2.69	24	
9	2.80	2.62	S	2.44	2.44	2.46	2.48	2.46	2.44	2.37	2.37	2.36	2.37	2.39	2.38	2.34	2.35	2.33	2.33	2.36	2.36	2.34	2.28	2.20	2.20	2.80	2.40	24	
10	2.15	S	2.13	2.18	2.28	2.36	2.36	2.39	2.42	2.42	2.38	2.24	2.18	2.16	2.14	2.14	2.24	2.21	2.22	2.25	2.29	2.30	2.32	2.29	2.13	2.42	2.26	24	
11	S	2.31	2.35	2.33	2.33	2.36	2.40	2.39	2.35	2.35	2.33	2.29	2.20	2.27	2.30	2.28	2.24	2.25	2.26	2.23	2.27	2.30	2.29	S	2.20	2.40	2.30	24	
12	2.32	2.33	2.31	2.32	2.31	2.32	2.33	2.31	2.31	2.30	2.37	2.36	2.26	2.24	2.25	2.28	2.27	2.29	2.31	2.33	2.37	2.60	S	2.64	2.24	2.64	2.34	24	
13	2.63	2.59	2.53	2.48	2.44	2.42	2.43	2.48	2.49	2.45	2.40	2.37	Q	Q	2.70	2.85	2.75	2.79	2.96	2.83	S	2.98	3.15	2.37	3.15	2.63	24		
14	3.29	3.25	3.08	3.06	2.96	2.88	2.77	2.65	2.64	2.49	2.47	2.42	2.35	2.28	2.22	2.16	2.13	2.14	2.17	2.22	S	2.21	2.23	2.22	2.13	3.29	2.53	24	
15	2.19	2.21	2.20	2.20	2.22	2.20	2.22	2.22	2.22	2.24	2.24	2.25	2.23	2.21	2.21	2.21	2.18	2.23	2.21	S	2.19	2.23	2.22	2.22	2.18	2.25	2.22	24	
16	2.20	2.22	2.22	2.24	2.28	2.32	2.35	2.34	2.36	2.36	2.37	2.37	2.36	2.32	2.31	2.30	2.32	2.33	S	2.31	2.32	2.37	2.36	2.36	2.20	2.37	2.32	24	
17	2.34	2.34	2.33	2.33	2.34	2.36	2.34	2.31	2.33	2.31	2.30	2.33	2.28	2.29	2.29	2.29	S	2.30	2.29	2.27	2.27	2.27	2.27	2.27	2.36	2.27	2.36	2.31	24
18	2.32	2.19	2.24	2.24	2.18	2.21	2.25	2.22	2.21	2.21	2.20	2.18	2.19	2.19	2.20	2.21	S	2.19	2.21	2.22	2.22	2.21	2.20	2.22	2.18	2.32	2.21	24	
19	2.28	2.30	2.29	2.34	2.33	2.34	2.40	2.52	2.56	2.55	2.55	2.55	2.50	2.50	2.44	S	2.28	2.28	2.28	2.33	2.33	2.36	2.39	2.40	2.28	2.56	2.40	24	
20	2.38	2.42	2.44	2.45	2.45	2.46	2.47	2.51	2.53	2.56	2.55	2.47	2.32	2.23	S	2.19	2.13	2.14	2.20	2.31	2.33	2.32	2.32	2.32	2.13	2.56	2.37	24	
21	2.29	2.29	2.30	2.29	2.31	2.37	2.61	2.73	2.74	2.75	2.62	2.44	2.38	S	2.28	2.27	2.25	2.23	2.23	2.21	2.22	2.23	2.23	2.23	2.21	2.75	2.37	24	
22	2.22	2.23	2.24	2.23	2.24	2.25	2.23	2.24	2.24	2.24	2.25	2.23	S	2.22	2.19	2.16	2.15	2.18	2.23	2.23	2.22	2.22	2.24	2.22	2.15	2.25	2.22	24	
23	2.23	2.22	2.23	2.21	2.22	2.21	2.21	2.22	2.21	2.26	2.24	S	2.21	2.22	2.25	2.26	2.28	2.25	2.34	2.36	2.34	2.33	2.32	2.32	2.21	2.36	2.26	24	
24	2.33	2.42	2.65	2.55	2.40	2.36	2.30	2.29	2.32	2.36	S	2.31	2.27	2.25	2.19	2.14	2.08	2.07	2.10	2.18	2.25	2.22	2.21	2.20	2.07	2.65	2.28	24	
25	2.21	2.22	2.23	2.24	2.23	2.25	2.29	2.31	2.27	S	2.24	2.23	2.22	2.22	2.22	2.25	2.25	2.27	2.31	2.31	2.35	2.26	2.31	2.36	2.21	2.36	2.26	24	
26	2.42	2.59	2.75	2.66	2.51	2.36	2.31	2.33	S	2.34	2.34	2.33	2.30	2.25	2.15	2.13	2.12	2.11	2.17	2.26	2.27	2.27	2.27	2.28	2.11	2.75	2.33	24	
27	2.28	2.28	2.27	2.28	2.25	2.25	2.22	S	2.23	2.22	2.22	2.20	2.20	2.20	2.21	2.21	2.22	2.24	2.23	2.25	2.25	2.24	2.25	2.23	2.20	2.28	2.24	24	
28	2.25	2.24	2.25	2.27	2.27	2.30	S	2.32	2.30	2.27	2.25	2.24	2.25	2.26	2.26	2.27	2.26	2.25	2.26	2.26	2.24	2.26	2.30	2.30	2.24	2.32	2.27	24	
29	2.27	2.31	2.30	2.31	2.31	S	2.35	2.35	2.32	2.29	2.31	2.31	2.27	2.28	2.27	2.25	2.26	2.28	2.30	2.38	2.36	2.34	2.34	2.36	2.25	2.38	2.31	24	
30	2.36	2.36	2.36	2.36	2.47	2.49	2.55	2.55	2.56	S	2.28	2.23	2.24	2.24	2.23	2.25	2.26	2.26	2.28	2.28	2.27	2.27	2.27	2.27	2.23	2.56	2.33	24	
31	2.28	2.29	2.29	S	2.28	2.30	2.30	2.30	2.28	2.28	2.28	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.28	2.29	2.32	2.33	2.35	2.34	2.33	2.28	2.35	2.30	24
HOURLY MAX	3.29	3.25	3.08	3.06	2.96	2.88	2.77	2.73	2.74	2.75	2.62	2.55	2.50	2.55	3.11	3.07	2.85	2.75	3.04	2.96	2.97	2.83	2.98	3.15					
HOURLY AVG	2.32	2.32	2.32	2.31	2.30	2.31	2.33	2.35	2.34	2.33	2.31	2.28	2.25	2.24	2.26	2.26	2.25	2.25	2.27	2.30	2.30	2.28	2.30	2.32					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

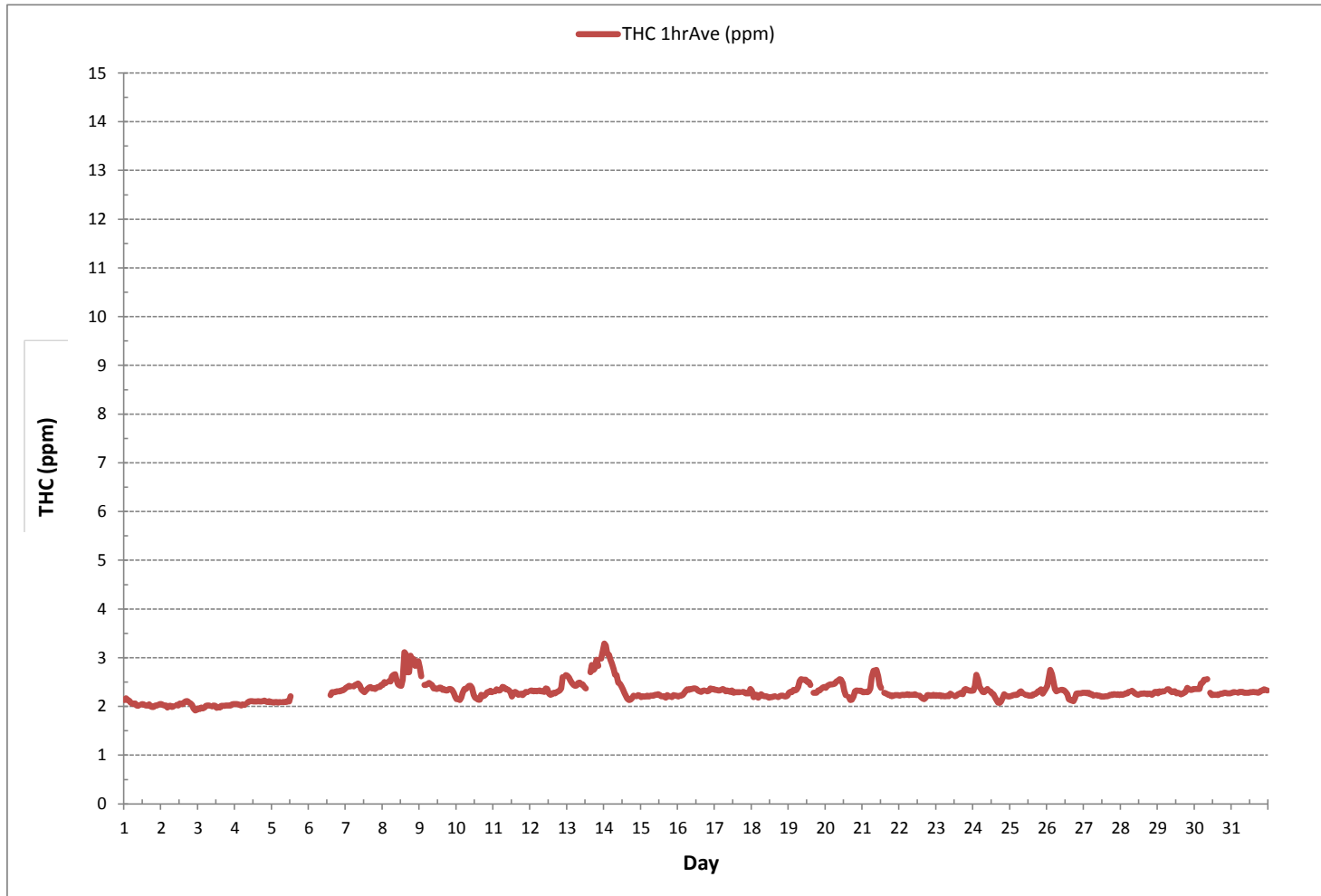
24 HR AVERAGES March 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	686			
MINIMUM 1-HR AVERAGE:	1.92 ppm	@ HOUR	22	ON DAY 2
MAXIMUM 1-HR AVERAGE:	3.29 ppm	@ HOUR	0	ON DAY 14
MAXIMUM 24-HR AVERAGE:	2.69 ppm			ON DAY 8
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	725 hrs	
MONTHLY CALIBRATION TIME:	6 hrs	AMD OPERATION UPTIME:	97.4 %	
STANDARD DEVIATION:	0.19	MONTHLY AVERAGE:	2.30 ppm	

TOTAL HYDROCARBONS Hourly Averages (THC ppm)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-THC[ppm]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

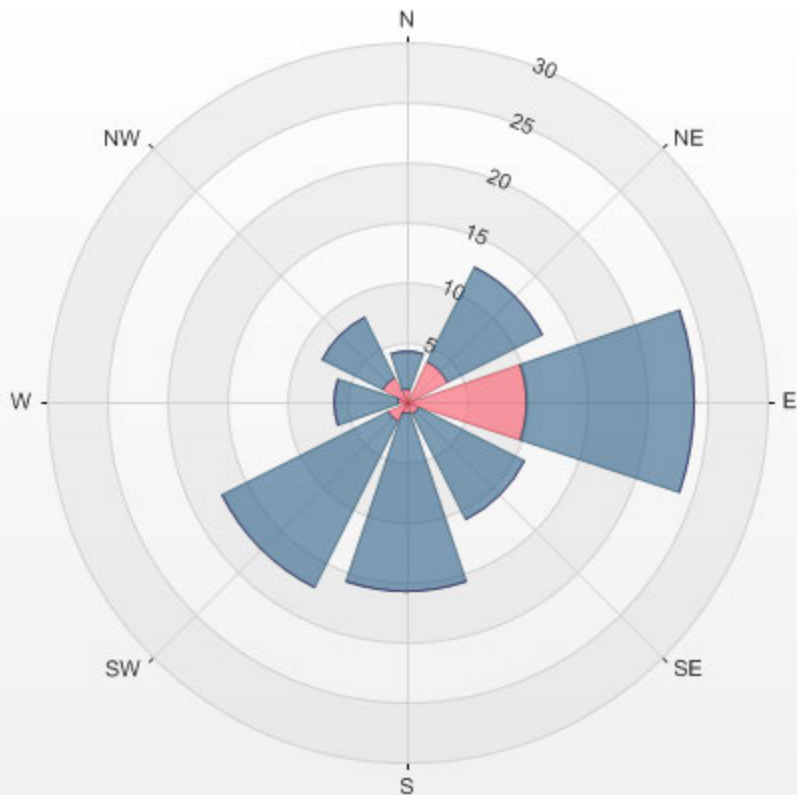
Calm: 0.88%

Calm Avg: 2.27 [ppm]

Direction	0.0-1.1	1.1-2.2	2.2-3.3	>3.3	Total
N	0.0	1.0	3.2	0.0	4.3
NE	0.0	3.8	8.8	0.0	12.6
E	0.0	10.0	14.1	0.0	24.1
SE	0.0	1.2	9.8	0.0	11.0
S	0.0	1.0	14.8	0.0	15.8
SW	0.0	1.8	15.5	0.0	17.3
W	0.0	0.7	5.4	0.0	6.2
NW	0.0	2.2	5.7	0.0	7.9
Summary	0.0	21.7	77.4	0.0	99.1

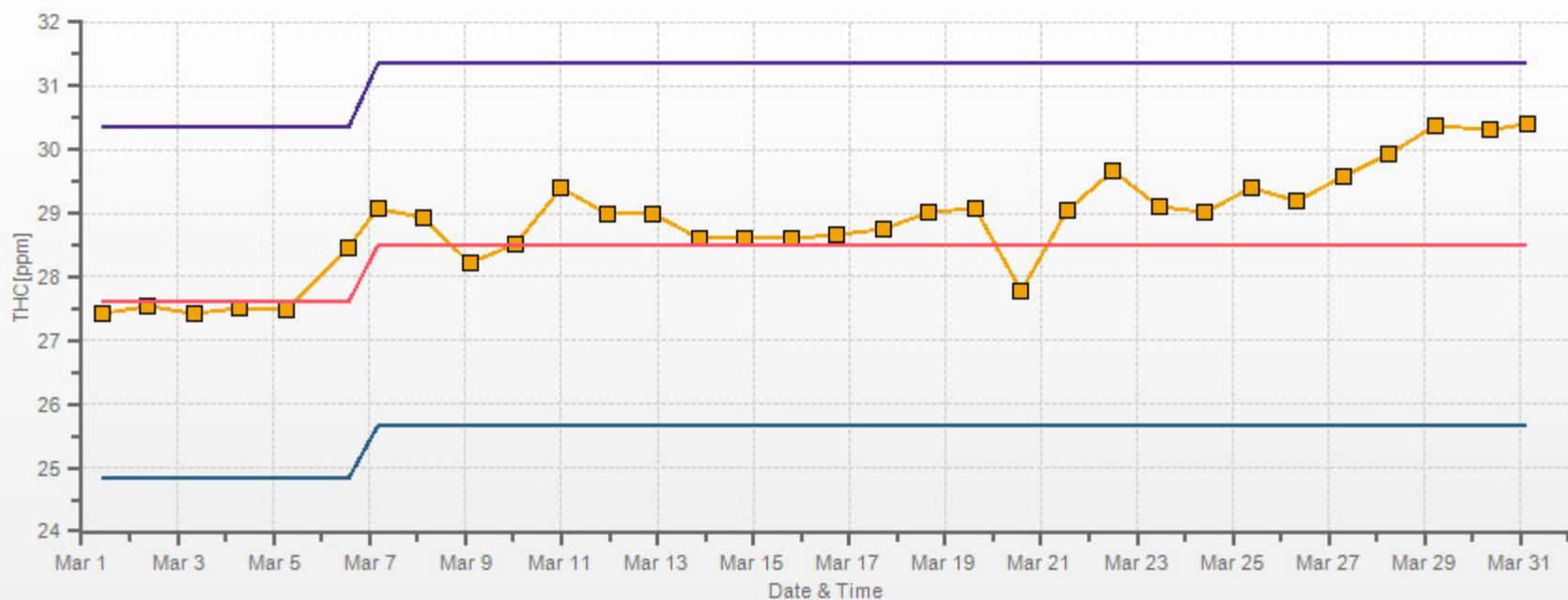
% Icon Classes (ppm) 0 0.0-1.1 22 1.1-2.2 77 2.2-3.3 0 >3.3

LICA ST. LINA Poll.: LICA ST. LINA-THC[ppm] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 0.88% Calm Poll Avg: 2.27[ppm]



THC[ppm] Calibration: LICA ST. LINA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



OXIDES OF NITROGEN



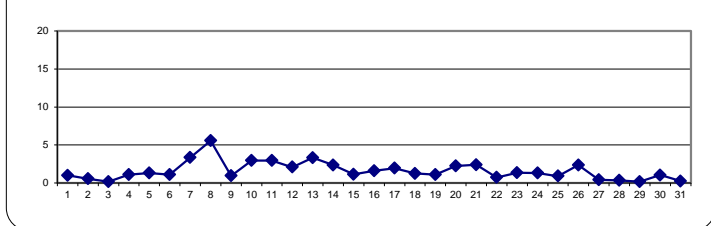
OXIDES OF NITROGEN Hourly Averages (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	1	1	1	1	1	1	1	1	1	13
1	0	1	0	0	1	0	1	1	1	S	2	1	2	1	0	1	1	0	0	0	0	0	0	0	0	0	2	1	24
2	0	0	0	0	0	0	0	0	S	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24
3	0	0	0	0	0	0	0	0	S	2	2	2	2	2	2	1	1	1	1	1	1	1	2	2	2	0	2	1	24
4	2	2	2	2	2	2	S	5	3	3	2	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	5	1	24
5	1	1	1	1	1	S	2	2	2	1	1	1	1	1	0	0	0	0	0	0	0	1	2	3	3	0	3	1	24
6	3	3	3	3	S	5	4	4	4	7	4	2	2	3	4	6	6	5	2	1	1	1	2	2	2	1	7	3	24
7	2	3	5	S	5	4	5	6	6	6	6	7	7	8	12	10	5	4	7	5	5	4	3	3	2	2	12	6	24
8	2	1	S	3	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	2	1	0	0	3	1	24
9	0	S	1	0	1	2	2	4	7	9	9	5	3	3	2	2	2	2	2	1	1	2	3	3	4	0	9	3	24
10	S	5	4	4	3	4	3	4	5	5	5	6	4	3	3	1	1	1	1	1	0	1	1	S	0	0	6	3	24
11	3	2	2	2	2	2	3	2	2	2	2	2	2	2	1	1	2	2	2	2	1	2	3	S	4	1	4	2	24
12	3	3	2	2	2	2	2	2	3	3	3	Q	Q	Q	Q	2	3	4	4	4	6	4	S	6	6	2	6	3	24
13	5	5	4	4	4	3	3	3	3	3	3	2	2	2	1	1	1	0	0	1	S	3	2	1	0	0	5	2	24
14	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	S	2	1	1	1	1	2	1	24
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	S	5	3	3	3	2	1	5	2	1	24
16	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	S	3	2	2	2	1	2	1	3	2	24
17	3	2	2	2	2	1	2	3	3	2	1	1	0	0	0	0	S	2	1	1	1	1	0	0	0	0	3	1	24
18	0	0	0	1	1	0	1	2	3	3	2	2	1	1	1	S	3	1	1	1	0	1	0	0	0	0	3	1	24
19	0	0	1	1	1	1	1	2	2	4	5	4	2	1	S	3	1	2	4	5	4	3	3	2	0	0	5	2	24
20	2	2	2	1	1	2	6	7	6	5	3	2	2	S	3	2	2	2	2	1	1	1	0	0	0	0	7	2	24
21	0	0	0	0	0	0	0	0	0	1	1	1	S	3	2	1	1	1	1	1	1	1	1	1	0	0	3	1	24
22	1	1	1	1	1	1	1	1	1	1	1	S	3	2	2	2	2	2	2	1	1	1	1	1	1	1	3	1	24
23	1	2	4	3	2	2	1	2	3	2	S	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	4	1	24
24	0	0	0	0	0	1	2	2	2	S	2	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	2	1	24
25	1	2	3	2	2	1	1	S	4	5	6	6	6	3	2	1	1	1	1	1	1	2	0	1	2	0	6	2	24
26	1	1	2	1	0	0	0	S	2	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	0	24
27	0	0	0	0	0	0	S	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	24
28	0	0	0	0	1	S	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24
29	0	0	0	0	S	3	3	3	5	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1	24
30	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	4	0	24
31	5	5	5	4	5	5	6	7	7	9	9	7	7	8	12	10	6	5	7	6	5	4	6	6	0	4	0		
HOURLY MAX	5	5	5	4	5	5	6	7	7	9	9	7	7	8	12	10	6	5	7	6	5	4	6	6					
HOURLY AVG	1	1	2	1	1	2	2	2	3	3	2	2	2	2	2	2	1	1	1	1	1	1	1	1					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

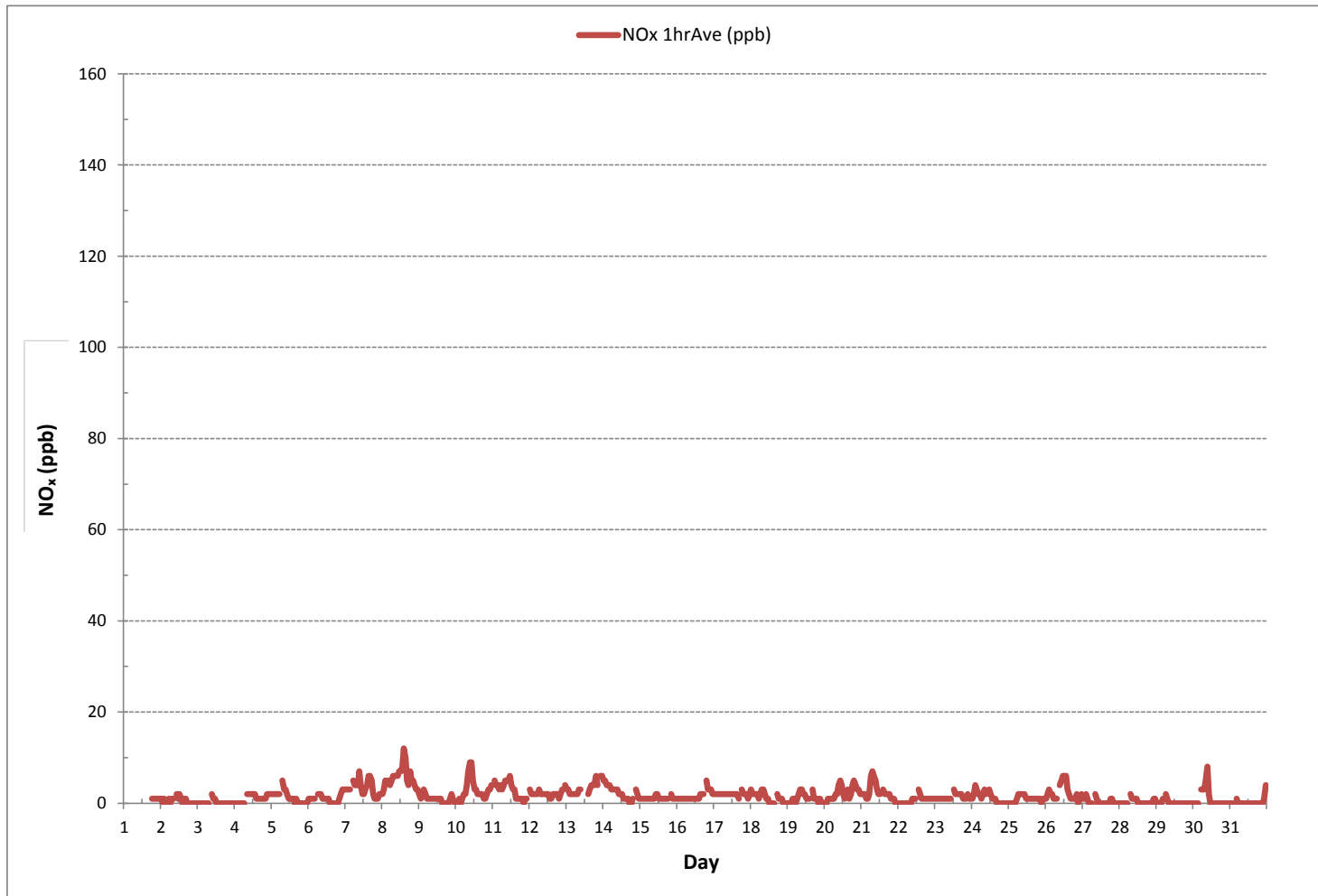
24 HR AVERAGES March 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	497			
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	1	ON DAY 2
MAXIMUM 1-HR AVERAGE:	12 ppb	@ HOUR	14	ON DAY 8
MAXIMUM 24-HR AVERAGE:	6 ppb			ON DAY 8
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	733 hrs	
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	98.5 %	
STANDARD DEVIATION:	2	MONTHLY AVERAGE:	2 ppb	

OXIDES OF NITROGEN Hourly Averages (NO_x ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NOX[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.87% Calm Avg: 1.51 [ppb]

Direction	0.0-4.3	4.3-8.7	8.7-13.0	>13.0	Total
N	4.1	0.3	0.0	0.0	4.4
NE	10.3	0.6	0.0	0.0	10.9
E	22.0	0.6	0.3	0.0	22.9
SE	9.0	1.7	0.0	0.0	10.7
S	14.1	1.6	0.0	0.0	15.7
SW	14.9	2.2	0.3	0.0	17.4
W	8.1	0.3	0.0	0.0	8.4
NW	8.7	0.1	0.0	0.0	8.8
Summary	91.2	7.4	0.6	0.0	99.1

% Icon Classes (ppb)

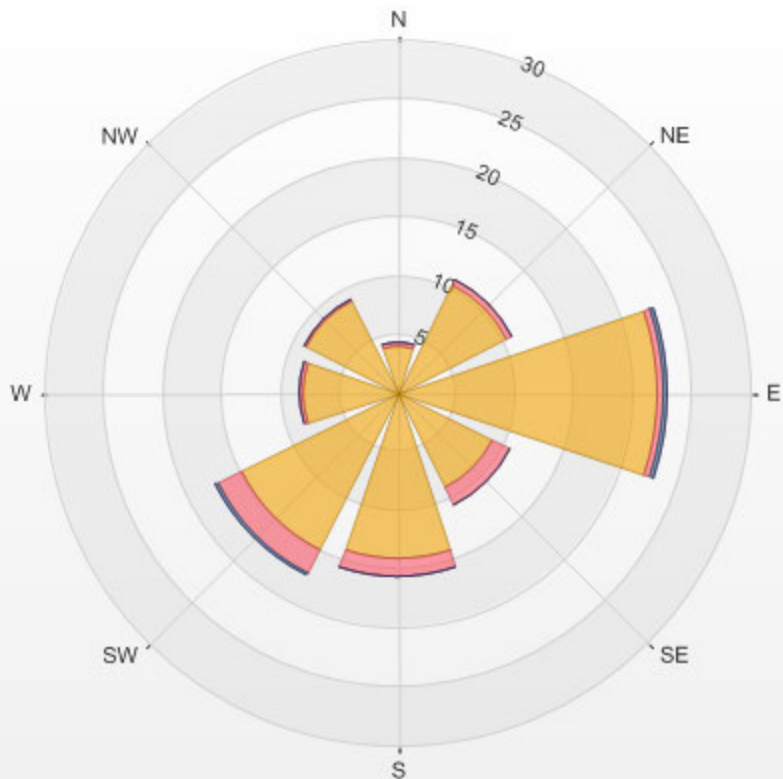
91 0.0-4.3

7 4.3-8.7

1 8.7-13.0

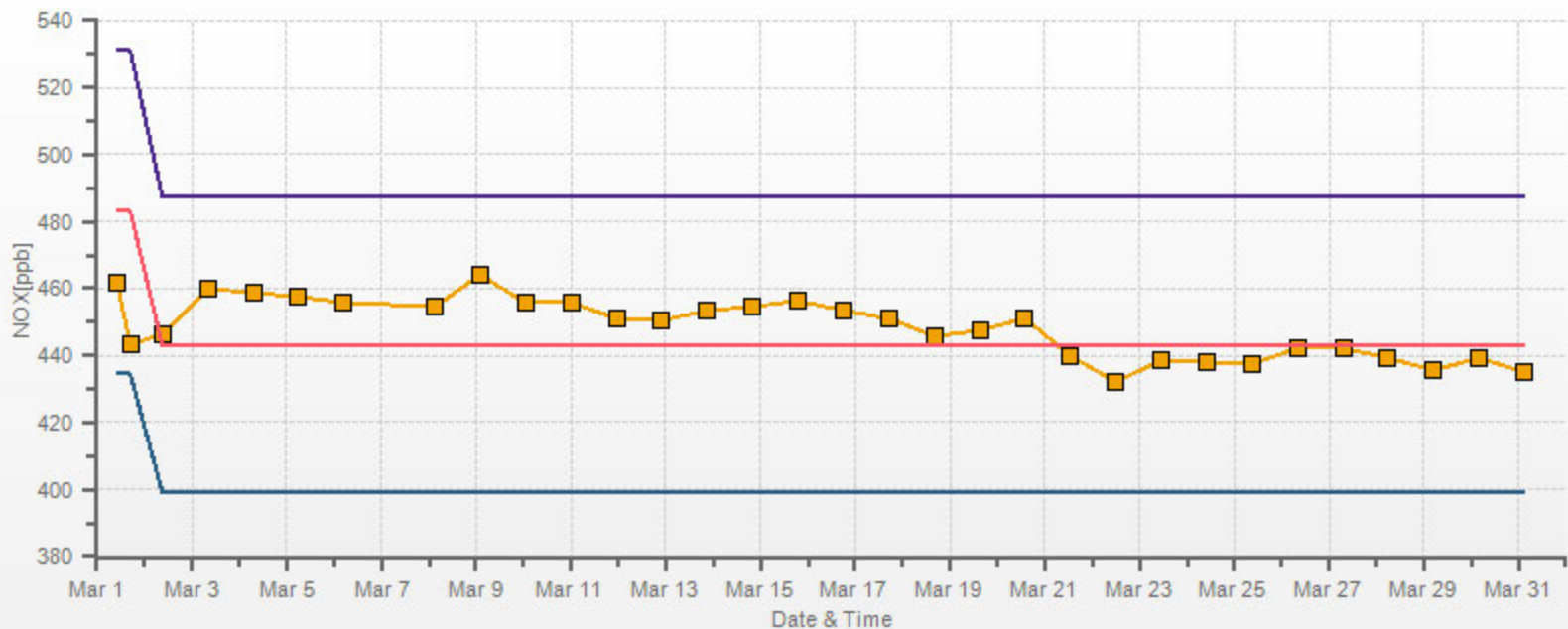
0 >13.0

LICA ST. LINA Poll.: LICA ST. LINA-NOX[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 0.87% Calm Poll Avg: 1.51[ppb]



NOX[ppb] Calibration: LICA ST. LINA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



NITRIC OXIDES

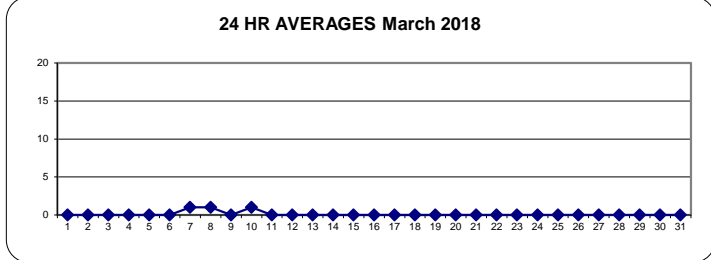
NITRIC OXIDE Hourly Averages (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.																						
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.																							
DAY																																																		
1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0																							
2	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
3	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
4	0	0	0	0	0	0	0	0	S	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
5	0	0	0	0	0	0	S	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0																						
6	0	0	0	0	0	S	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0																						
7	0	0	0	0	S	0	0	0	0	1	3	2	1	2	1	2	2	2	1	0	0	0	0	0	0	0	0	0																						
8	0	0	0	S	0	0	0	0	1	1	2	2	2	2	2	2	4	3	1	0	0	0	0	0	0	0	0	0																						
9	0	0	S	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
10	0	S	0	0	0	0	0	0	0	2	3	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0																						
11	S	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	S	0	0	0																						
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0																						
13	0	0	0	0	0	0	0	0	0	1	1	Q	Q	Q	Q	1	1	1	0	0	0	0	0	S	0	0	0	0																						
14	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0																						
15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0																						
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	S	0	0	0	0	0	0	0																						
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0																						
18	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0																						
19	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0																						
20	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	S	0	0	0	0	0	0	0	0	0	0	0	0																						
21	0	0	0	0	0	0	0	0	1	1	1	1	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0																						
22	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
23	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
24	0	0	0	0	0	0	0	0	1	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
25	0	0	0	0	0	0	0	0	0	1	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
26	0	0	0	0	0	0	0	0	0	S	1	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0																						
27	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
28	0	0	0	0	0	0	S	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
29	0	0	0	0	0	S	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
30	0	0	0	0	S	0	0	1	2	4	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0																						
31	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
HOURLY MAX	0	0	0	0	0	0	0	1	2	4	3	2	2	2	4	3	2	1	0	0	0	0	0	0	0	0	0	0																						
HOURLY AVG	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

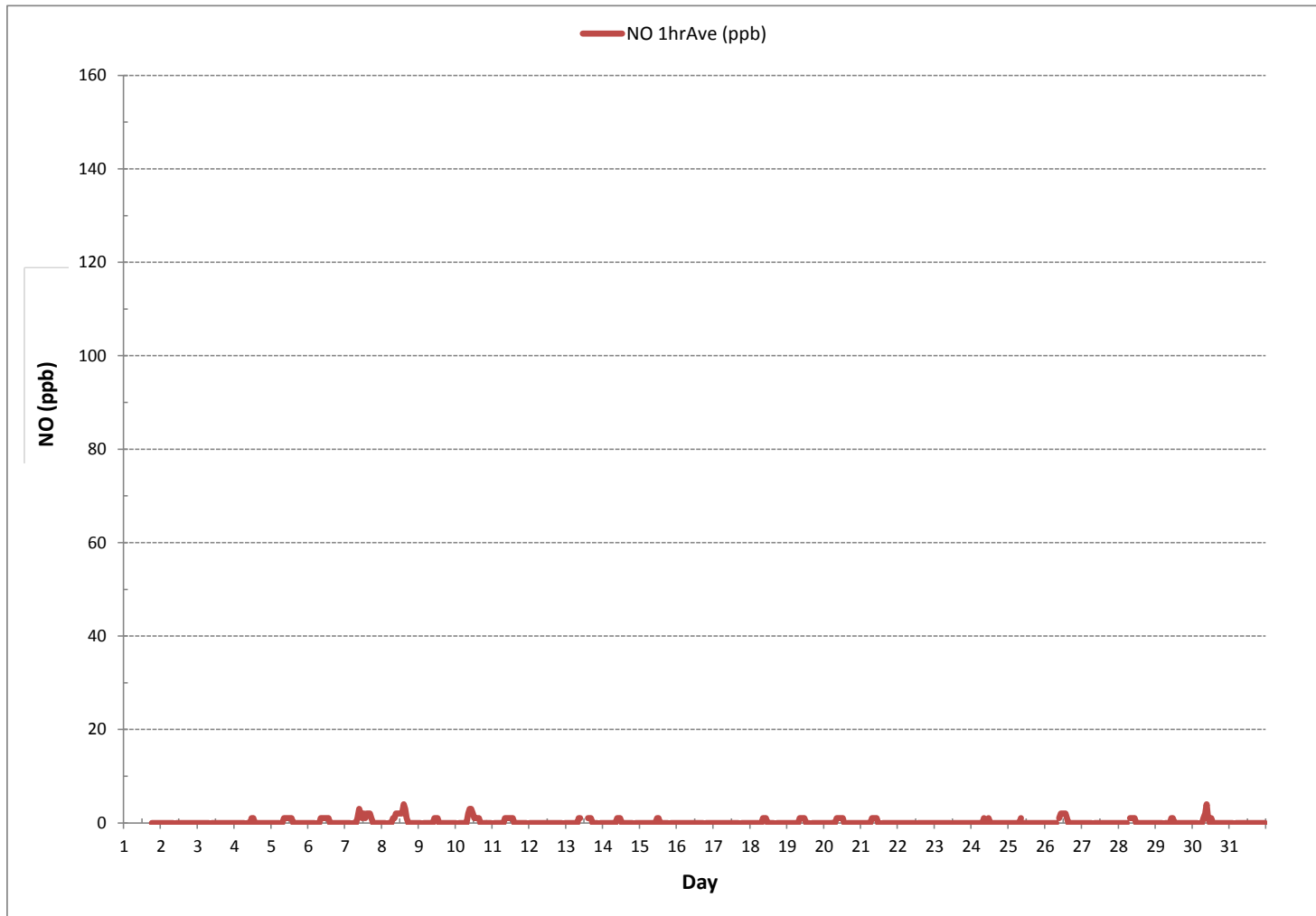
24 HR AVERAGES March 2018



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	97				
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	18	ON DAY	1
MAXIMUM 1-HR AVERAGE:	4 ppb	@ HOUR	8	ON DAY	8
MAXIMUM 24-HR AVERAGE:	1 ppb			ON DAY	7
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	733 hrs		
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	98.5 %		
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	0 ppb		

NITRIC OXIDE Hourly Averages (NO ppb)



Wind: LICA ST. LINA
Poll.: LICA ST. LINA-NO[ppb]
Monthly: 18/03
Type: PollutionRose
Direction: Blowing From (Wind Frequency)
Based On 1 Hr.

Calm: 0.87%

Calm Avg: 0.19 [ppb]

Direction	0.0-1.7	1.7-3.3	3.3-5.0	>5.0	Total
N	4.1	0.1	0.1	0.0	4.3
NE	10.9	0.0	0.0	0.0	10.9
E	22.6	0.1	0.1	0.0	22.9
SE	10.1	0.6	0.0	0.0	10.7
S	15.4	0.3	0.0	0.0	15.7
SW	15.8	1.6	0.0	0.0	17.4
W	8.4	0.0	0.0	0.0	8.4
NW	8.8	0.0	0.0	0.0	8.8
Summary	96.1	2.7	0.3	0.0	99.1

% Icon Classes (ppb)

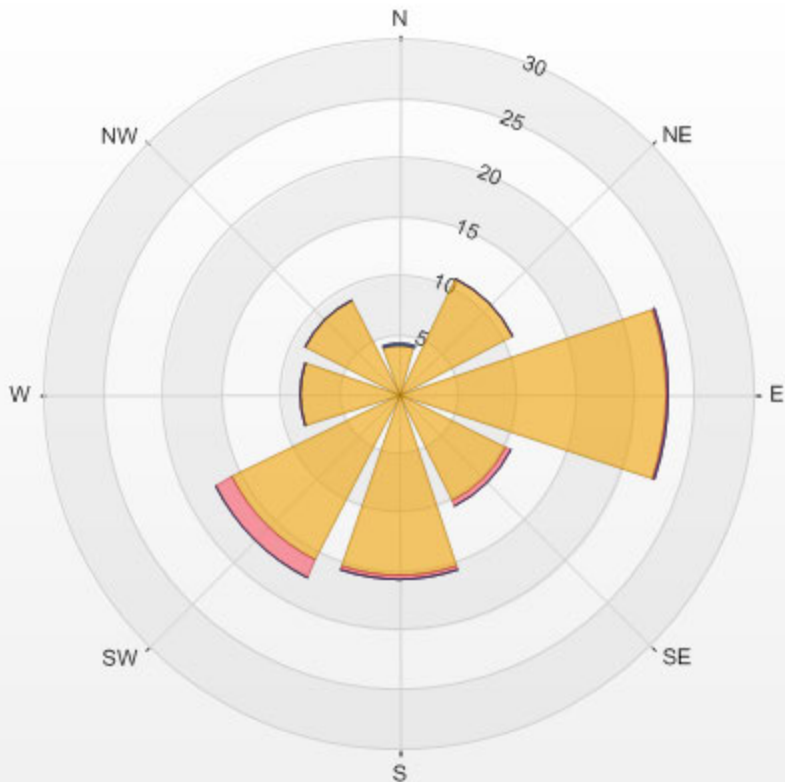
96 0.0-1.7

3 1.7-3.3

0 3.3-5.0

0 >5.0

LICA ST. LINA Poll.: LICA ST. LINA-NO[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 0.87% Calm Poll Avg: 0.19[ppb]



NITROGEN DIOXIDE

NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	1	1	1	1	1	1	1	1	1	13
1	0	1	0	0	1	0	1	1	S	2	1	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	2	1	24
2	0	0	0	0	0	0	0	0	S	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
3	0	0	0	0	0	0	0	0	S	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	0	2	1	24	
4	2	2	2	2	2	2	S	4	3	2	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	4	1	24	
5	1	1	1	1	1	S	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	2	3	3	0	3	24	
6	3	3	3	3	S	5	4	4	3	4	2	1	1	1	2	4	4	4	2	1	1	1	2	2	1	5	3	24	
7	2	3	5	S	5	4	4	5	5	5	4	5	5	5	8	7	4	4	7	5	5	4	3	3	2	8	5	24	
8	2	1	S	2	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	2	1	0	2	1	24	
9	0	S	1	0	1	2	2	4	5	6	6	3	2	2	2	2	2	2	1	1	2	3	3	4	0	6	2		
10	S	5	4	4	3	4	3	4	4	4	4	4	3	3	2	1	1	1	1	1	0	1	1	S	0	5	3	24	
11	3	2	2	2	2	2	3	2	2	2	2	2	2	2	1	1	2	2	2	2	1	2	3	S	4	1	4	2	
12	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	1	3	3	4	4	6	4	S	6	5	1	6	3	
13	5	5	4	4	4	3	3	3	3	2	2	1	1	1	1	1	0	0	1	S	3	2	1	0	5	2	1	24	
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	2	1	1	1	1	2	1	24	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	S	5	3	3	3	2	1	5	2		
16	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	S	3	2	2	1	2	1	3	2	
17	3	2	2	2	2	1	2	3	2	1	1	0	0	0	0	0	S	2	1	1	1	0	0	0	0	3	1	24	
18	0	0	0	1	1	0	1	2	2	2	2	1	1	1	1	S	2	1	1	1	0	1	0	0	0	2	1	24	
19	0	0	1	1	1	1	1	2	2	3	3	1	1	S	3	1	2	4	4	4	3	3	2	0	4	2	4	2	
20	2	2	2	1	1	2	6	6	5	4	2	2	1	S	3	2	2	2	2	1	1	1	0	0	0	6	2	24	
21	0	0	0	0	0	0	0	0	0	1	1	1	S	2	2	1	1	1	1	1	1	1	1	1	0	2	1	24	
22	1	1	1	1	1	1	1	1	1	1	1	S	3	2	2	2	2	2	1	1	1	1	1	1	1	3	1	24	
23	1	2	4	3	2	2	1	2	2	1	S	3	1	1	1	1	0	0	0	0	0	0	0	0	4	1	1	24	
24	0	0	0	0	0	1	2	2	1	S	2	1	1	1	1	1	1	1	1	1	1	0	1	0	2	1	2	24	
25	1	2	3	2	2	1	1	S	3	3	4	4	4	2	2	1	1	1	1	1	2	0	1	2	0	4	2	24	
26	1	1	2	1	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	24	
27	0	0	0	0	0	0	S	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	24	
28	0	0	0	0	1	S	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	24	
29	0	0	0	0	S	3	2	3	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	24	
30	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	4	0	24	
31	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	4	0	24	
HOURLY MAX	5	5	5	4	5	5	6	6	5	6	6	5	5	5	8	7	4	4	7	6	5	4	6	5					
HOURLY AVG	1	1	2	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

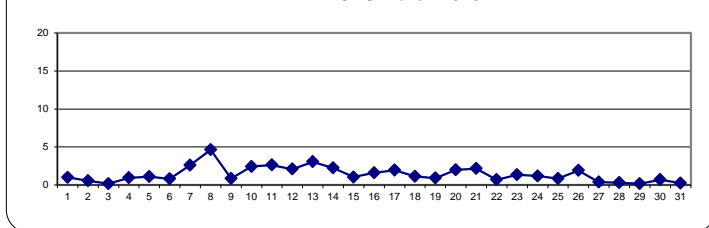
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT: 1-HR 159 ppb

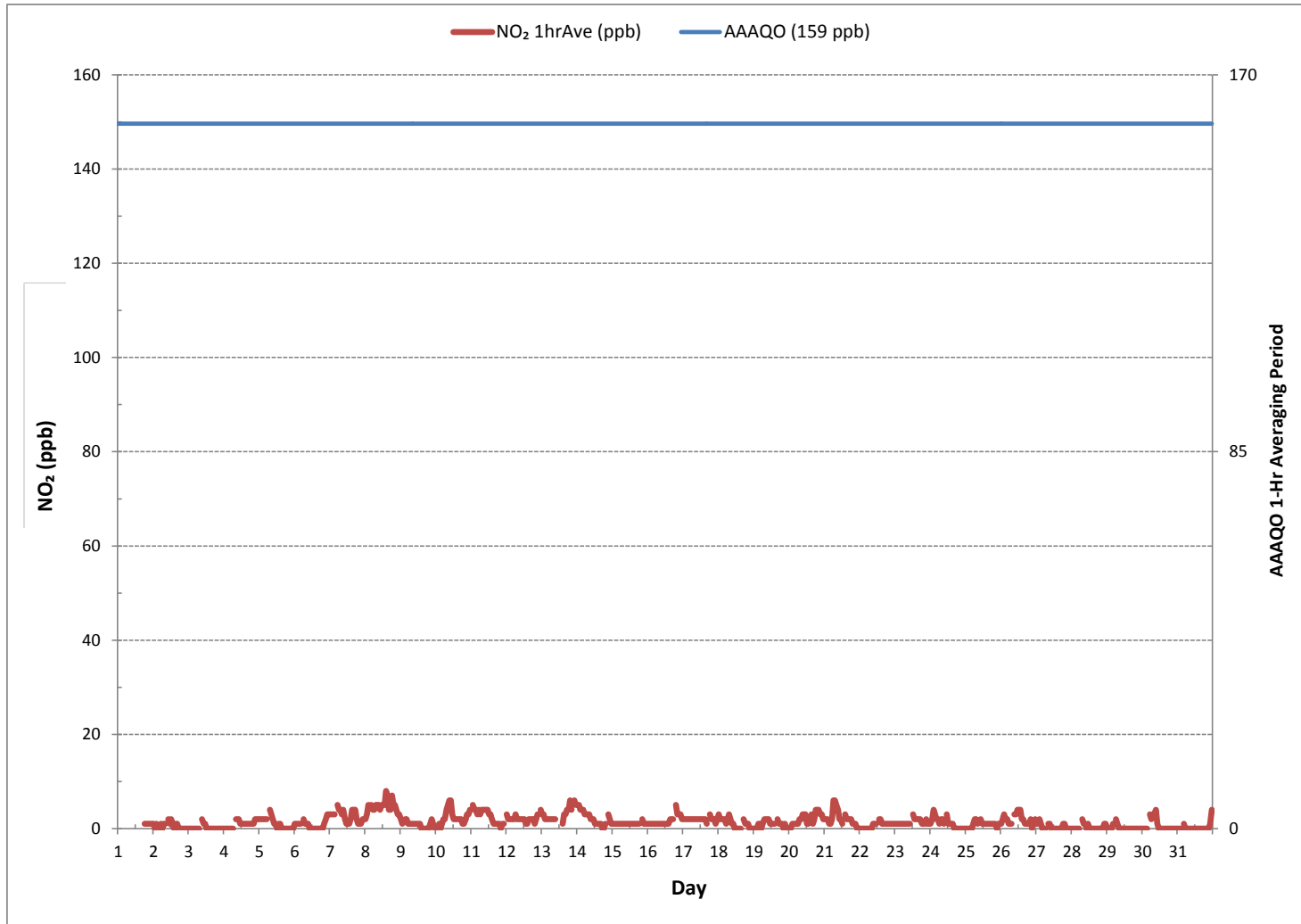
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0				
NUMBER OF NON-ZERO READINGS:	488				
MINIMUM 1-HR AVERAGE:	0 ppb	@ HOUR	1	ON DAY	2
MAXIMUM 1-HR AVERAGE:	8 ppb	@ HOUR	14	ON DAY	8
MAXIMUM 24-HR AVERAGE:	5 ppb			ON DAY	8
IZS CALIBRATION TIME:	31 hrs	OPERATIONAL TIME:	733 hrs		
MONTHLY CALIBRATION TIME:	7 hrs	AMD OPERATION UPTIME:	98.5 %		
STANDARD DEVIATION:	1	MONTHLY AVERAGE:	1 ppb		

24 HR AVERAGES March 2018



NITROGEN DIOXIDE Hourly Averages (NO₂ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-NO2[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.87%

Calm Avg: 1.32 [ppb]

Direction	0.0-3.0	3.0-6.0	6.0-9.0	>9.0	Total
N	4.1	0.3	0.0	0.0	4.4
NE	10.3	0.3	0.3	0.0	10.9
E	21.2	1.5	0.3	0.0	22.9
SE	8.6	2.0	0.1	0.0	10.7
S	13.2	2.5	0.0	0.0	15.7
SW	12.6	4.8	0.0	0.0	17.4
W	7.8	0.6	0.0	0.0	8.4
NW	8.7	0.1	0.0	0.0	8.8
Summary	86.4	12.0	0.7	0.0	99.1

% Icon Classes (ppb)

86

0.0-3.0

12

3.0-6.0

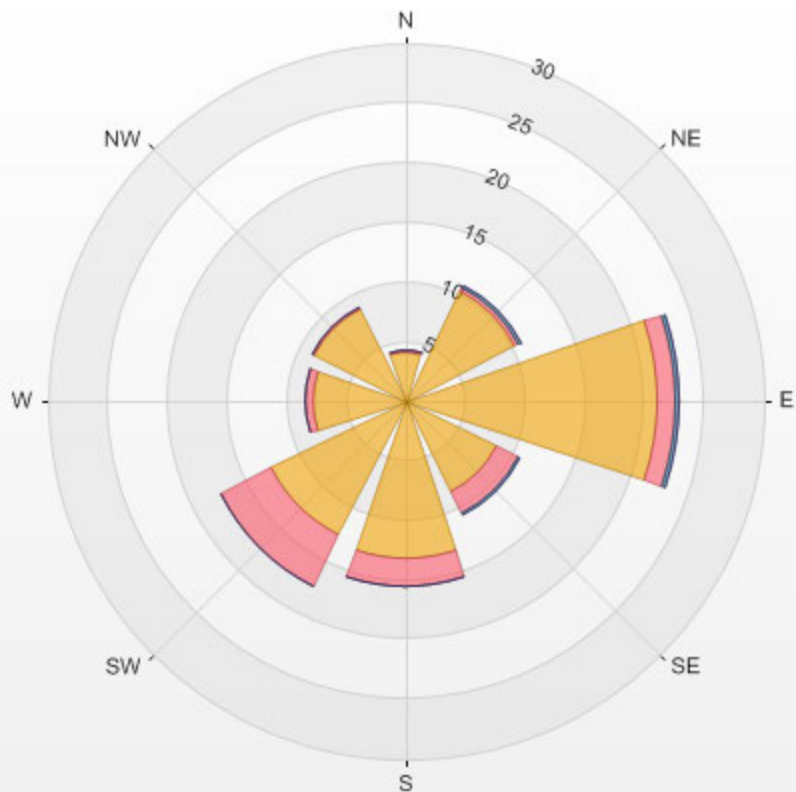
1

6.0-9.0

0

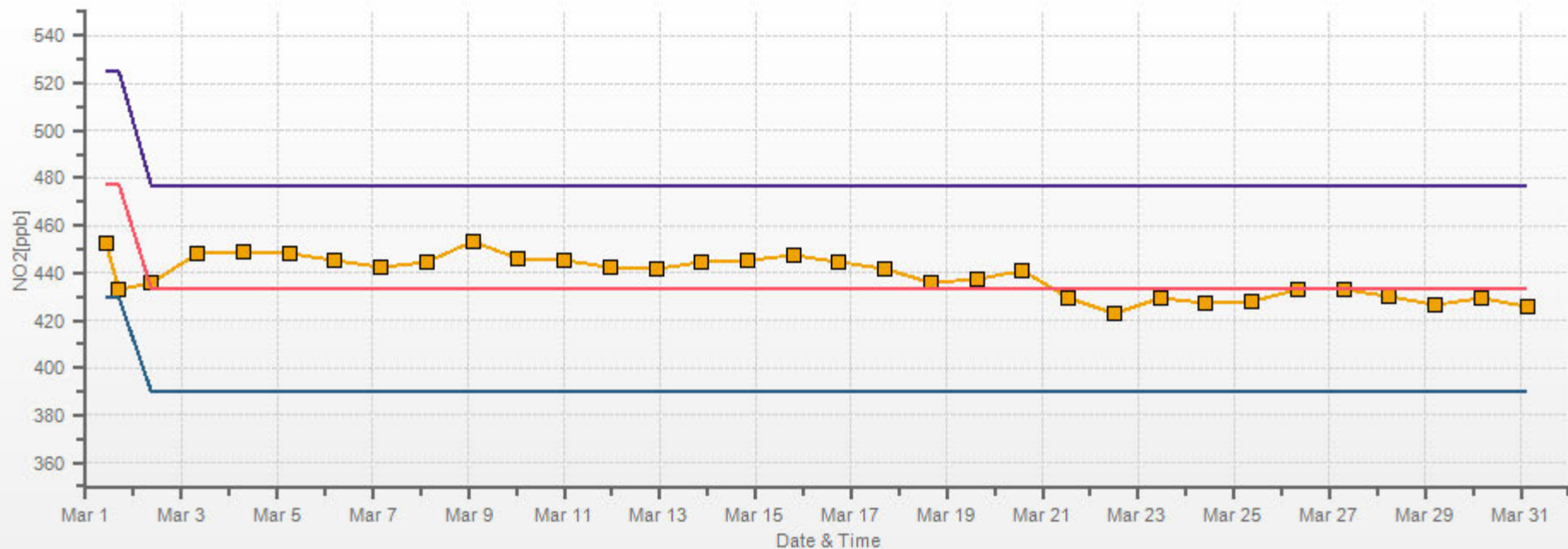
>9.0

LICA ST. LINA Poll.: LICA ST. LINA-NO2[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 0.87% Calm Poll Avg: 1.32[ppb]



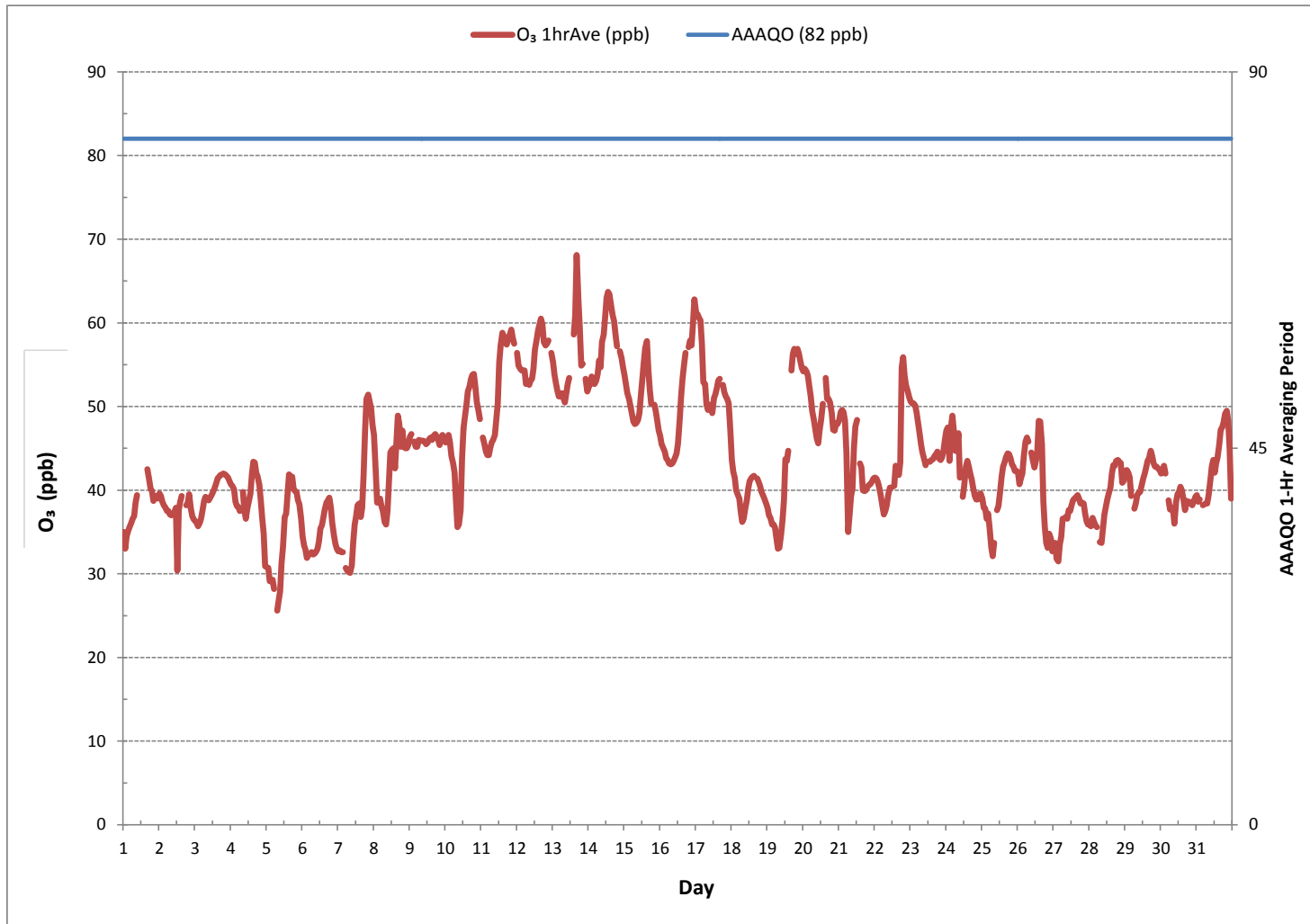
NO2[ppb] Calibration: LICA ST. LINA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



OZONE

OZONE Hourly Averages (O₃ ppb)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-O3[ppb]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

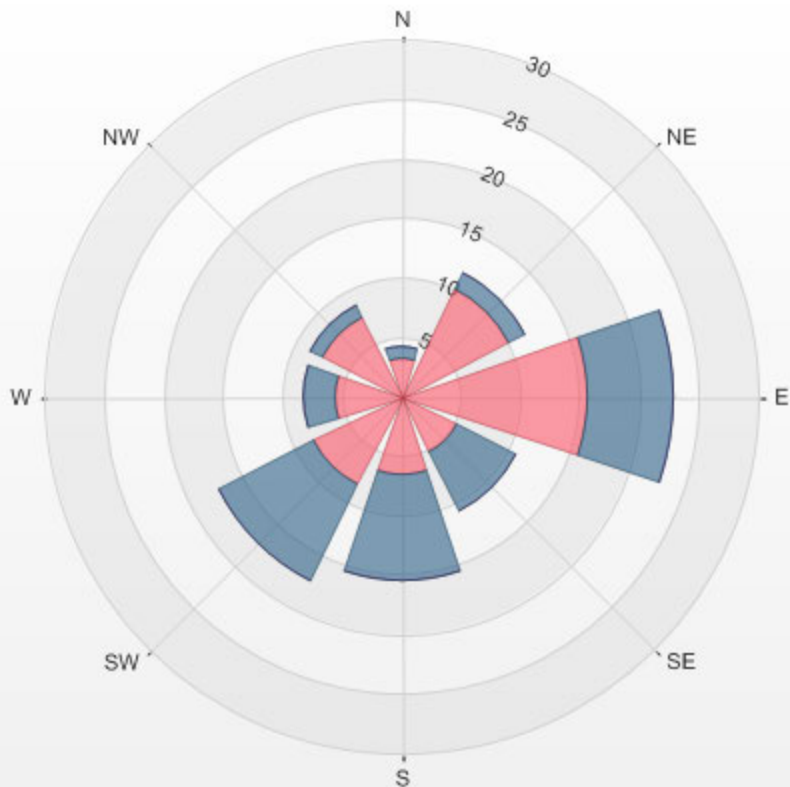
Calm: 0.85%

Calm Avg: 43.93 [ppb]

Direction	0.0-22.7	22.7-45.5	45.5-68.2	>68.2	Total
N	0.0	3.3	1.0	0.0	4.3
NE	0.0	10.1	1.6	0.0	11.7
E	0.0	15.7	7.3	0.0	22.9
SE	0.0	5.3	5.4	0.0	10.7
S	0.0	6.6	8.8	0.0	15.4
SW	0.0	8.3	9.0	0.0	17.2
W	0.0	5.7	2.6	0.0	8.3
NW	0.0	7.4	1.3	0.0	8.7
Summary	0.0	62.3	36.9	0.0	99.1

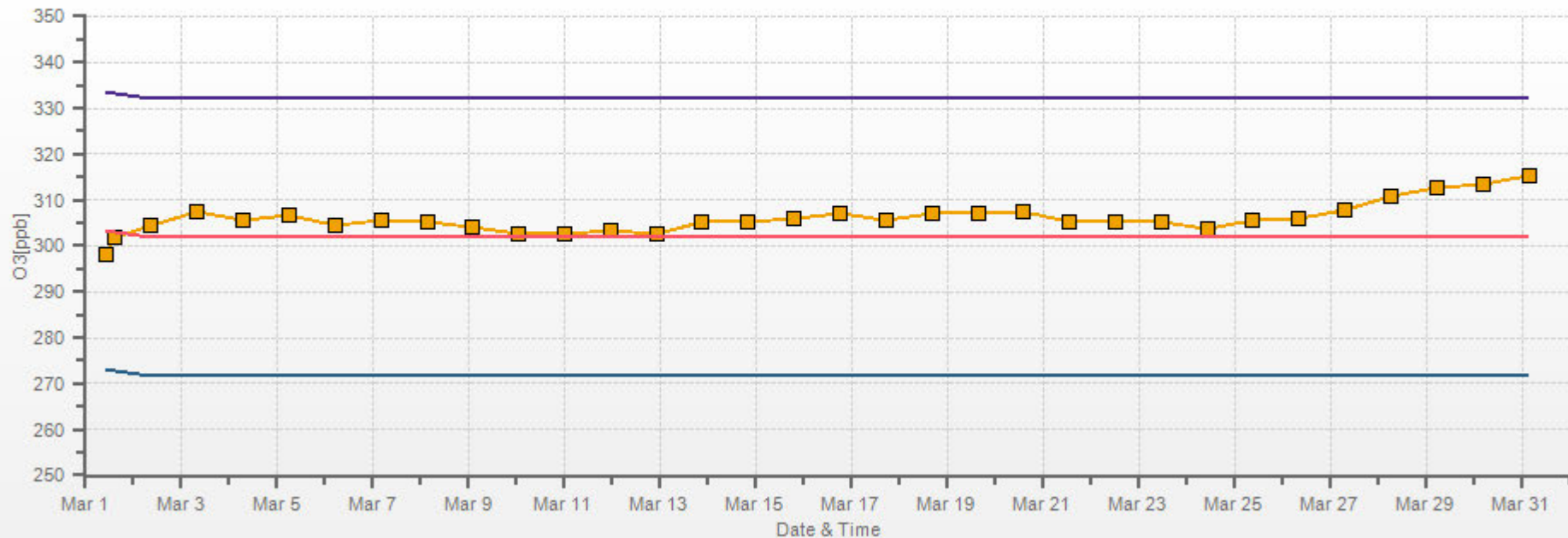
% Icon Classes (ppb) 0 0.0-22.7 62 22.7-45.5 37 45.5-68.2 0 >68.2

LICA ST. LINA Poll.: LICA ST. LINA-O3[ppb] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 0.85% Calm Poll Avg: 43.93[ppb]



O3[ppb] Calibration: LICA ST. LINA Monthly: 18/03 Type: Span

Span Meas Span Ref Span Low Span High



PARTICULATE MATTER 2.5

PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2	7	5	3	3	3	2	2	1	2	2	2	2	1	1	1	1	2	2	1	1	1	1	2	1	7	2	24
2	1	1	2	2	2	2	2	2	3	3	4	4	4	4	4	5	5	5	4	4	5	4	4	3	1	5	3	24
3	3	2	3	4	4	4	4	4	4	3	4	4	4	4	4	4	5	6	6	5	5	5	5	5	2	6	4	24
4	6	7	6	4	4	3	3	4	11	13	13	13	10	10	9	8	8	6	6	6	6	6	6	6	3	13	7	24
5	6	5	5	5	5	6	7	9	9	8	6	6	6	8	8	4	6	6	6	6	8	9	9	9	4	9	7	24
6	9	8	7	7	5	3	2	2	4	5	5	5	5	C	C	6	5	5	4	5	7	8	8	8	2	9	6	24
7	9	10	10	10	11	11	11	11	12	14	12	8	8	9	11	12	10	7	7	8	9	9	11	17	7	17	10	24
8	14	18	18	19	20	19	22	22	23	17	14	12	13	12	14	13	11	10	13	11	10	8	8	9	8	23	15	24
9	9	9	8	7	6	5	7	9	10	10	10	10	11	10	8	9	10	9	9	10	15	22	15	8	5	22	10	24
10	4	3	4	6	13	19	20	21	22	18	16	8	5	4	4	3	3	2	3	4	4	5	5	2	22	8	24	
11	6	6	9	9	10	14	15	17	18	18	16	17	10	10	8	6	4	4	3	4	6	8	8	8	3	18	10	24
12	10	14	15	16	18	18	16	14	13	13	12	12	9	8	8	8	7	7	6	6	8	11	12	12	6	18	11	24
13	11	11	11	11	12	12	12	12	13	14	15	15	17	18	Q	23	19	18	19	16	16	15	17	11	23	15	24	
14	16	17	17	16	15	14	14	13	12	9	8	7	6	6	4	3	2	2	2	2	2	3	3	2	17	8	24	
15	3	3	3	3	3	3	3	3	4	4	4	5	5	5	5	4	3	2	2	2	2	2	2	2	2	5	3	24
16	2	2	2	2	2	3	3	4	4	5	6	7	10	10	9	11	12	12	15	16	17	16	17	17	2	17	9	24
17	16	16	18	18	19	18	17	15	19	20	9	9	9	10	11	10	10	10	11	11	10	13	10	8	8	20	13	24
18	5	1	1	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	4	5	4	4	4	4	1	5	2	24
19	4	5	5	5	5	5	6	7	11	10	10	8	6	10	14	9	6	5	5	5	6	6	7	4	14	7	24	
20	8	10	12	13	15	16	19	19	22	24	24	21	12	10	11	9	4	5	8	8	9	8	7	7	4	24	13	24
21	7	8	8	9	10	12	13	15	16	18	19	17	12	8	5	5	4	4	3	3	3	3	3	4	3	19	9	24
22	4	3	3	3	4	4	4	4	5	5	7	8	10	10	9	8	7	6	6	5	5	5	5	3	10	6	24	
23	5	6	7	8	10	10	9	9	8	7	6	6	9	9	10	11	11	7	5	7	9	11	10	10	5	11	8	24
24	9	12	14	11	9	6	3	4	8	8	8	7	5	3	3	2	1	2	2	2	3	3	4	6	1	14	6	24
25	7	1	1	1	1	1	2	3	3	3	2	3	4	5	6	7	10	10	11	10	10	9	11	11	1	11	6	24
26	11	13	16	18	19	13	12	12	17	18	16	15	15	12	7	5	7	6	3	3	3	2	1	1	1	19	10	24
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	2	1	24
28	2	2	2	2	2	3	3	4	5	4	4	4	3	3	3	3	4	4	4	3	4	4	5	5	2	5	3	24
29	5	5	6	6	5	5	6	6	6	6	6	6	6	6	4	4	4	3	3	4	4	4	4	3	3	6	5	24
30	3	3	3	3	4	4	12	5	4	4	3	2	4	3	3	3	3	3	2	2	2	2	2	3	2	12	3	24
31	4	4	4	4	4	3	3	3	3	3	3	2	4	4	4	3	2	3	3	4	4	6	6	5	2	6	4	24
HOURLY MAX	16	18	18	19	20	19	22	22	23	24	24	21	15	17	18	13	23	19	18	19	17	22	17	17				
HOURLY AVG	7	7	7	7	8	8	8	8	9	9	9	8	7	7	7	6	6	6	6	6	6	7	7	7				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

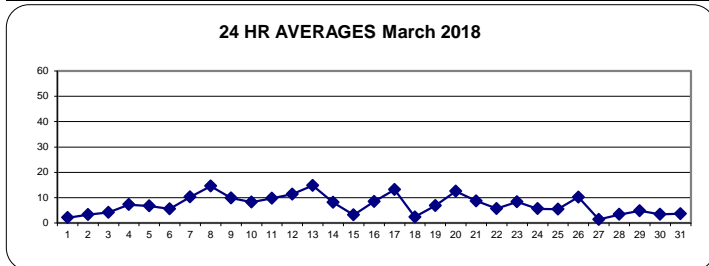
OBJECTIVE LIMIT:

ALBERTA ENVIRONMENT:	1-HR	80 µg/m ³	24-HR	30 µg/m ³
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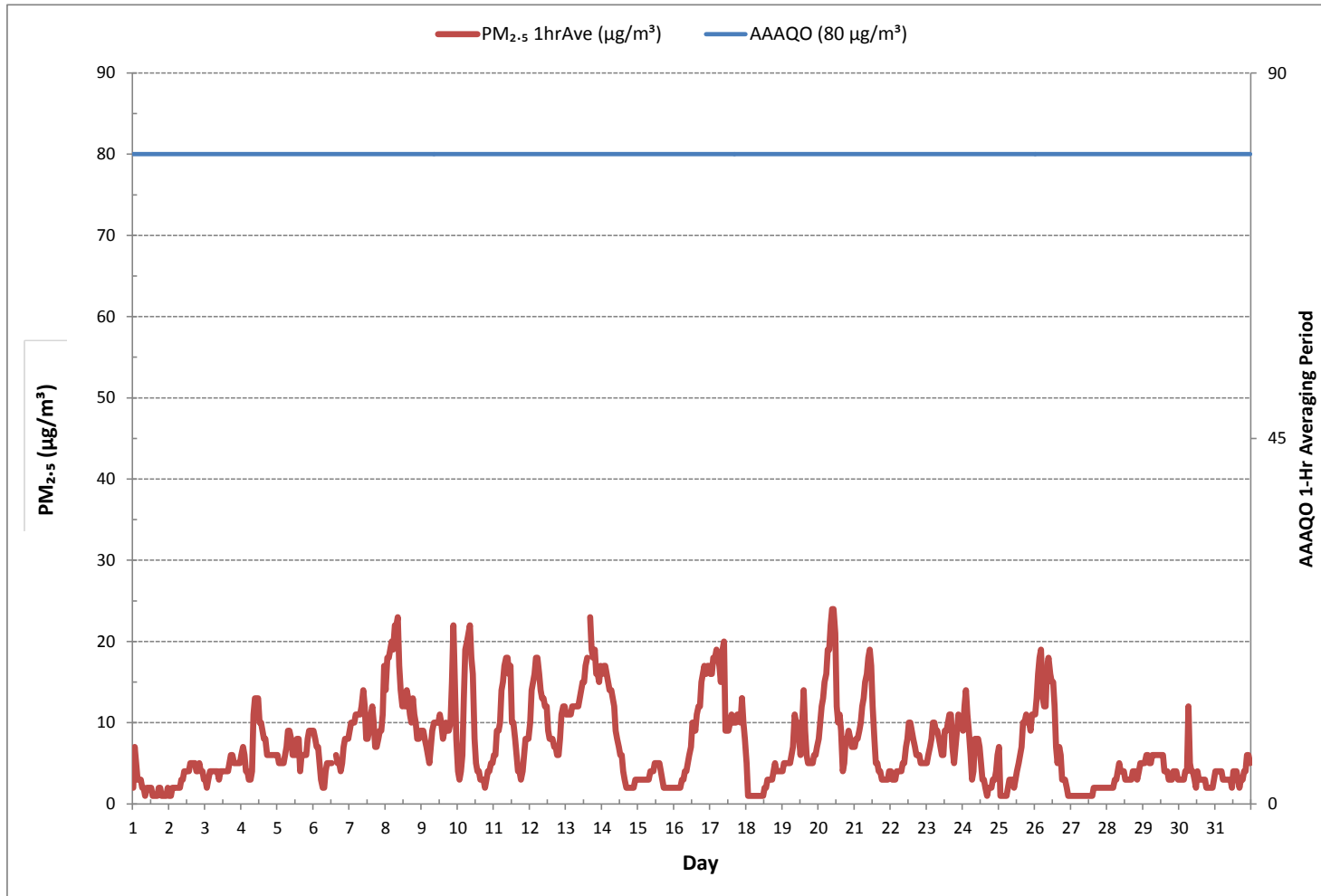
MONTHLY SUMMARY

NUMBER OF 1-HR EXCEEDANCES:	0		
NUMBER OF 24-HR EXCEEDANCES:	0		
NUMBER OF NON-ZERO READINGS:	741		
MINIMUM 1-HR AVERAGE:	1 µg/m ³ @ HOUR	8 ON DAY	1
MAXIMUM 1-HR AVERAGE:	24 µg/m ³ @ HOUR	9 ON DAY	20
MAXIMUM 24-HR AVERAGE:	15 µg/m ³	ON DAY	13
MONTHLY CALIBRATION TIME:	2 hrs	OPERATIONAL TIME:	744 hrs
STANDARD DEVIATION:	5	AMD OPERATION UPTIME:	100.0 %
		MONTHLY AVERAGE:	7 µg/m ³

24 HR AVERAGES March 2018



PARTICULATE MATTER < 2.5 MICRONS Hourly Averages (PM_{2.5} µg/m³)



Wind: LICA ST. LINA
 Poll.: LICA ST. LINA-PM25[ug/m3(L)]
 Monthly: 18/03
 Type: PollutionRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.95%

Calm Avg: 8.52 [ug/m3(L)]

Direction	0.0-5.0	5.0-10.0	10.0-15.0	15.0-20.0	20.0-25.0	>25.0	Total
N	3.0	0.4	0.3	0.4	0.0	0.0	4.1
NE	8.8	1.5	1.1	0.5	0.1	0.0	12.1
E	14.1	6.1	1.8	1.4	0.0	0.0	23.3
SE	3.9	4.3	2.0	0.5	0.0	0.0	10.8
S	2.4	6.1	4.3	1.8	0.4	0.0	15.0
SW	3.3	5.0	4.9	2.7	1.0	0.0	16.8
W	4.7	2.7	0.0	1.0	0.1	0.0	8.5
NW	4.5	3.4	0.4	0.3	0.0	0.0	8.5
Summary	44.7	29.5	14.8	8.5	1.6	0.0	99.1

% Icon Classes (ug/m3(L))

45  0.0-5.0

30  5.0-10.0

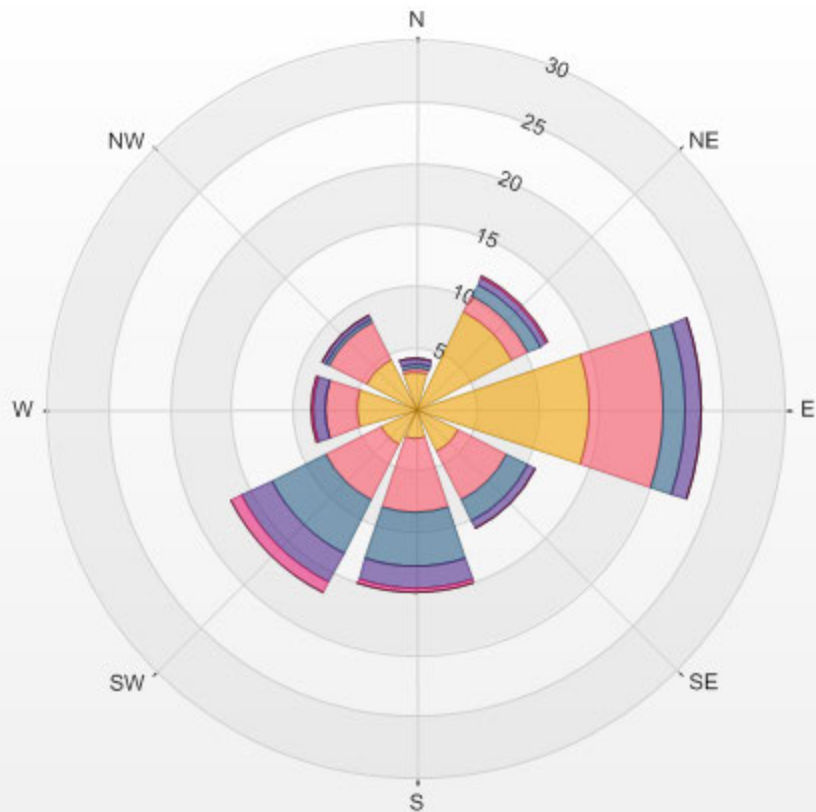
15  10.0-15.0

9  15.0-20.0

2  20.0-25.0

0  >25.0

LICA ST. LINA Poll.: LICA ST. LINA-PM25[ug/m3(L)] 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 0.95% Calm Poll Avg: 8.52[ug/m3(L)]



WIND SPEED



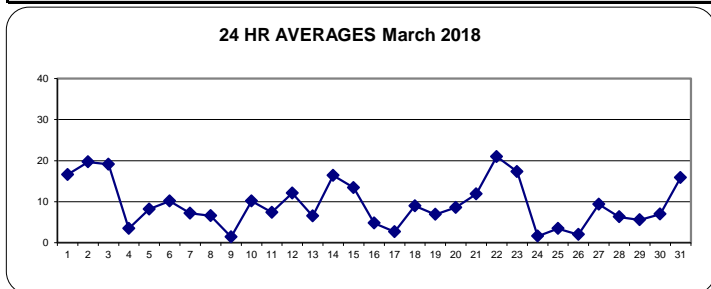
WIND SPEED Hourly Averages (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	12.0	12.5	13.1	13.4	14.0	14.5	14.9	15.1	15.5	16.7	15.9	16.9	17.2	18.5	19.4	19.9	19.3	16.6	15.4	17.4	19.1	20.8	22.4	18.3	12.0	22.4	16.6	24
2	17.0	17.5	21.4	19.2	20.3	18.5	16.9	18.3	25.6	23.1	20.1	17.6	19.0	17.1	16.9	19.4	18.9	20.2	23.1	22.7	21.4	20.2	19.6	19.8	16.9	25.6	19.7	24
3	19.4	20.7	19.5	22.2	24.3	24.4	23.2	21.9	23.8	23.0	24.0	24.3	20.6	17.9	16.4	16.1	15.3	15.7	16.0	17.2	17.5	17.4	15.2	13.7	13.7	24.4	19.1	24
4	12.0	11.7	11.2	10.9	10.4	10.1	11.6	6.2	4.3	5.3	6.5	8.0	6.6	5.4	5.4	6.1	5.0	3.7	2.4	1.1	3.3	3.3	3.1	4.4	1.1	12.0	3.5	24
5	7.5	5.1	7.8	6.2	7.3	8.2	7.8	7.7	7.8	8.8	12.1	13.4	13.3	11.2	12.1	10.6	8.3	9.6	8.1	5.4	7.0	6.8	6.5	9.5	5.1	13.4	8.2	24
6	10.0	7.7	9.3	9.3	9.5	11.3	10.3	11.1	12.2	12.1	14.4	12.7	12.3	9.7	10.1	12.5	13.8	12.2	9.9	9.8	9.4	9.2	9.4	9.5	7.7	14.4	10.2	24
7	9.0	9.4	9.1	8.7	7.8	6.0	5.7	4.5	3.7	4.6	6.1	5.9	5.7	6.1	6.2	6.8	7.1	7.6	8.7	9.7	9.6	10.0	9.8	7.9	3.7	10.0	7.2	24
8	8.8	8.0	7.2	4.9	3.9	3.2	6.6	7.6	8.5	7.6	10.0	9.8	9.5	9.8	9.7	10.6	9.7	9.8	10.3	10.2	13.5	13.5	13.1	12.0	3.2	13.5	6.6	24
9	11.6	12.2	12.2	10.1	10.5	9.4	9.5	7.5	7.8	7.4	3.2	1.7	3.5	5.9	10.0	10.4	7.8	6.4	6.1	7.6	9.6	9.2	10.5	10.2	1.7	12.2	1.4	24
10	10.5	10.5	9.6	9.7	8.9	11.1	9.3	9.7	9.6	9.0	9.0	12.1	12.5	14.9	16.6	19.2	14.7	11.5	10.3	9.6	9.4	7.1	7.8	8.1	7.1	19.2	10.2	24
11	8.3	10.0	9.9	9.2	8.8	7.3	6.9	8.0	6.3	3.4	4.4	5.3	7.6	5.9	8.4	8.3	8.0	6.1	6.8	8.9	9.4	11.9	10.8	9.5	3.4	11.9	7.4	24
12	9.4	9.8	10.9	10.0	12.8	12.0	12.0	11.5	12.6	12.1	11.6	11.6	13.0	13.7	13.4	11.0	10.2	9.3	9.6	13.1	15.5	16.3	15.0	15.2	9.3	16.3	12.1	24
13	13.9	11.8	11.3	11.2	11.0	11.0	6.6	5.0	6.7	9.2	7.3	4.8	4.6	3.6	5.2	7.3	6.2	6.9	7.4	9.3	11.6	12.7	10.3	8.9	3.6	13.9	6.5	24
14	11.1	14.0	15.0	14.1	14.8	16.1	14.3	14.0	13.2	16.6	15.6	18.1	19.9	16.7	16.8	21.3	20.5	22.2	18.2	14.2	17.8	19.1	17.7	17.8	11.1	22.2	16.4	24
15	17.3	19.4	17.6	15.2	12.2	13.0	12.9	11.4	9.8	13.9	14.3	10.8	11.7	13.2	10.9	9.9	11.8	11.1	12.7	16.8	16.2	16.2	14.8	12.7	9.8	19.4	13.4	24
16	10.7	8.7	8.3	8.9	6.3	5.9	4.5	4.7	5.4	4.9	6.0	6.0	4.3	6.9	7.6	5.8	6.0	8.1	5.2	2.7	5.2	5.6	5.4	6.1	2.7	10.7	4.8	24
17	4.8	5.8	4.5	4.2	5.5	4.8	4.9	4.3	3.0	1.8	4.7	4.6	6.8	7.3	7.6	5.6	2.3	1.5	3.4	1.8	2.1	3.4	6.9	10.4	1.5	10.4	2.7	24
18	11.5	14.1	9.6	9.1	9.9	9.8	8.4	11.1	11.8	11.0	11.9	10.8	12.3	11.3	10.6	8.1	7.8	6.7	5.8	6.3	6.9	5.7	5.6	6.3	5.6	14.1	9.0	24
19	7.9	6.8	8.0	6.7	6.3	5.5	4.7	4.9	5.9	5.9	6.5	9.0	10.7	9.1	12.0	12.1	10.3	10.9	8.9	8.3	9.9	11.1	10.8	11.3	4.7	12.1	6.9	24
20	11.1	12.8	13.8	12.9	14.1	11.7	10.2	9.0	8.5	6.6	4.9	5.9	3.6	5.6	7.5	8.8	11.3	9.2	7.3	7.0	7.3	7.5	7.9	7.1	3.6	14.1	8.6	24
21	7.1	6.5	4.6	1.2	4.7	7.2	10.8	13.6	13.8	14.1	14.3	16.3	15.4	16.0	16.4	15.3	15.1	17.0	19.4	18.7	19.0	18.9	18.4	19.4	1.2	19.4	11.9	24
22	19.8	20.8	20.3	18.5	17.5	19.2	19.0	18.9	18.8	18.7	20.0	20.0	21.1	22.5	25.2	25.5	19.9	21.2	20.4	23.0	22.2	26.9	28.4	32.7	17.5	32.7	21.0	24
23	31.3	33.9	32.2	31.0	32.3	29.0	29.2	29.3	28.2	26.1	20.7	20.3	20.6	16.6	12.9	8.1	7.0	3.1	2.6	7.6	9.0	10.1	9.3	11.2	2.6	33.9	17.3	24
24	11.5	11.4	11.1	14.1	13.9	12.3	10.7	10.5	9.7	12.2	10.7	6.5	8.1	7.7	9.2	8.3	11.2	10.1	11.4	9.2	7.1	6.9	7.4	5.1	5.1	14.1	1.6	24
25	5.6	4.9	5.9	7.2	6.6	9.6	7.2	0.5	8.2	9.9	5.8	6.7	9.7	8.8	10.5	8.3	4.5	1.5	5.2	3.3	4.6	7.2	10.1	12.2	0.5	12.2	3.5	24
26	11.4	11.7	14.2	12.0	13.3	14.0	12.7	11.9	10.9	9.7	11.4	8.6	4.5	7.4	15.3	9.6	17.1	16.0	13.5	14.7	14.1	14.3	12.7	11.1	4.5	17.1	2.0	24
27	14.7	14.7	11.9	11.3	10.8	13.6	17.6	15.6	18.5	20.3	18.8	17.5	15.8	12.4	9.4	7.1	6.0	6.9	7.1	7.9	8.4	9.2	7.4	3.3	3.3	20.3	9.4	24
28	5.9	5.9	8.3	9.6	9.1	9.2	8.6	7.6	9.4	16.0	17.5	14.4	10.5	12.3	10.9	11.0	10.8	9.6	9.5	8.0	6.3	7.4	13.5	16.5	5.9	17.5	6.3	24
29	16.7	14.6	12.7	9.0	9.0	9.3	8.9	9.8	7.8	8.3	6.8	3.8	3.3	5.2	5.5	6.2	7.3	7.0	7.7	8.0	10.0	8.9	9.5	9.0	3.3	16.7	5.6	24
30	9.7	9.4	7.2	6.2	7.8	6.3	6.7	5.7	7.5	8.9	11.9	11.5	14.1	17.0	17.2	16.6	19.5	18.3	13.7	9.9	9.2	10.5	10.8	9.6	5.7	19.5	7.0	24
31	8.6	8.6	10.9	13.5	13.8	12.9	12.0	12.4	12.4	12.9	17.9	18.9	20.8	24.4	28.2	26.5	25.4	22.1	20.1	16.3	14.6	14.1	16.3	13.4	8.6	28.2	15.9	24
HOURLY MAX	31.3	33.9	32.2	31.0	32.3	29.0	29.2	29.3	28.2	26.1	24.0	24.3	21.1	24.4	28.2	26.5	25.4	22.2	23.1	23.0	22.2	26.9	28.4	32.7				
HOURLY AVG	4.9	4.9	4.5	4.3	4.1	4.2	4.4	4.1	4.3	4.2	3.3	3.2	2.8	2.3	1.9	1.6	1.3	1.5	2.3	3.1	3.5	4.0	4.1	4.4				

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

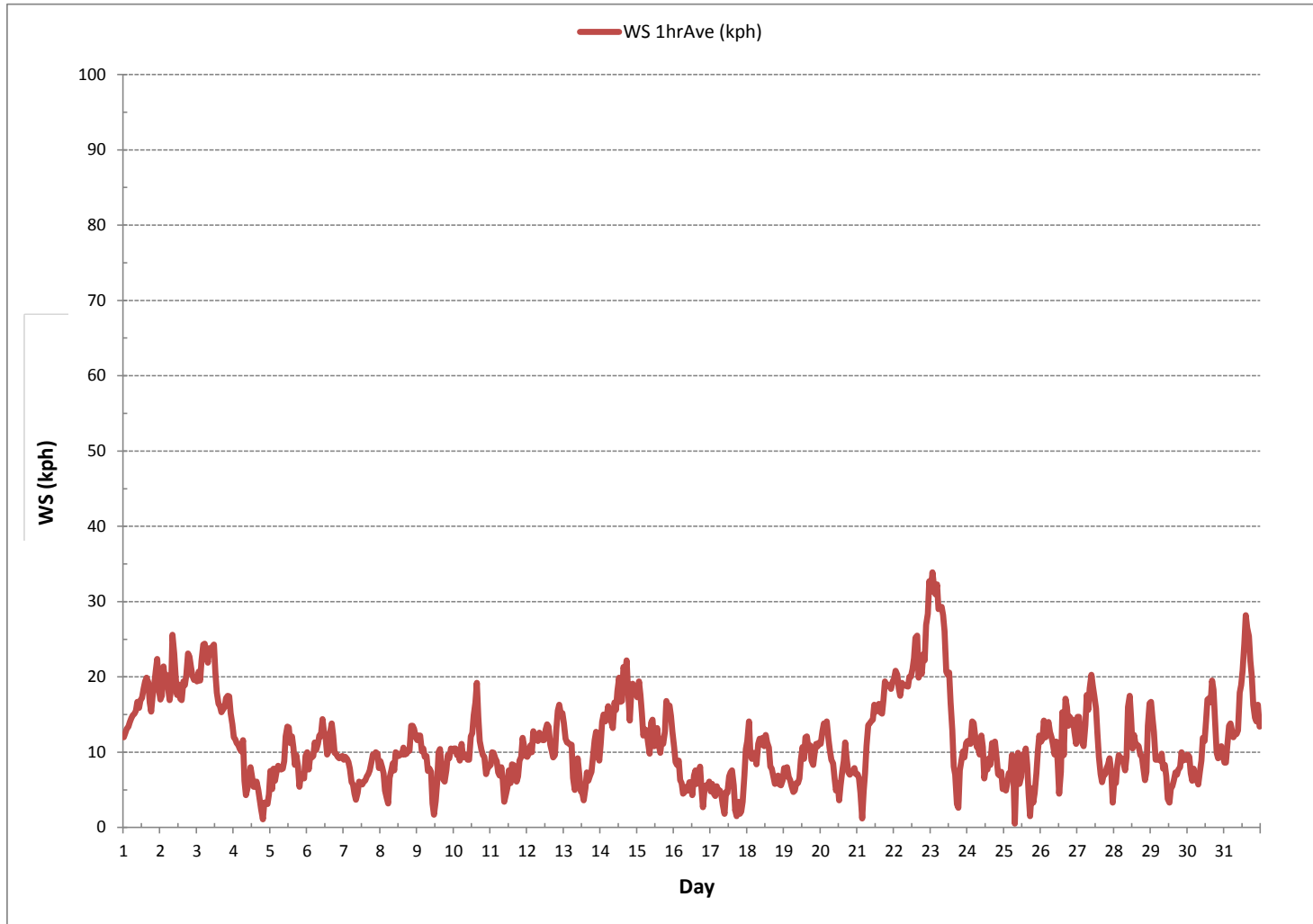
LAST CALIBRATION:	May 25, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST



MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	744
MINIMUM 1-HR AVERAGE:	0.5 kph @ HOUR 7 ON DAY 25
MAXIMUM 1-HR AVERAGE:	33.9 kph @ HOUR 1 ON DAY 23
MAXIMUM 24-HR AVERAGE:	21.0 kph ON DAY 22
MONTHLY CALIBRATION TIME:	0 hrs
OPERATIONAL TIME:	744 hrs
AMD OPERATION UPTIME:	100.0 %
STANDARD DEVIATION:	5.6
MONTHLY AVERAGE:	3.4 kph

WIND SPEED Hourly Averages (WS kph)



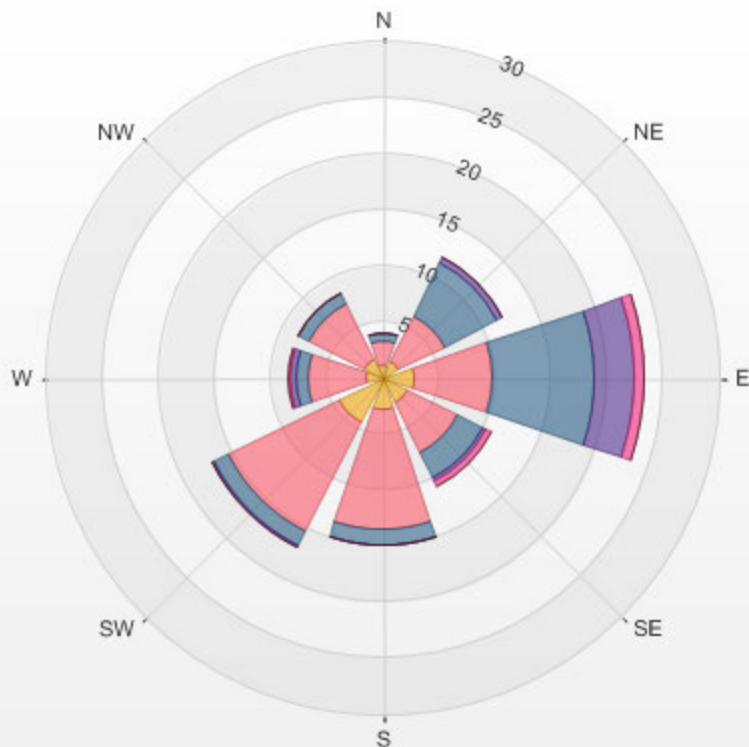
Wind: LICA ST. LINA
 Monitor: WSP [kph]
 Monthly: 18/03
 Type: WindRose
 Direction: Blowing From (Wind Frequency)
 Based On 1 Hr.

Calm: 0.94%

Direction	1.8-6.8	6.8-13.6	13.6-20.4	20.4-27.2	27.2-34.0	>34.0	Total
N	1.1	2.3	0.7	0.0	0.0	0.0	4.0
NE	1.6	4.6	5.2	0.5	0.0	0.0	12.0
E	2.8	7.0	9.0	3.6	0.9	0.0	23.4
SE	2.4	5.1	2.4	0.4	0.5	0.0	10.9
S	2.8	10.8	1.3	0.0	0.0	0.0	14.9
SW	4.4	10.9	1.5	0.1	0.0	0.0	16.9
W	1.5	5.2	1.1	0.5	0.1	0.0	8.5
NW	1.9	5.5	1.1	0.0	0.0	0.0	8.5
Summary	18.6	51.3	22.3	5.2	1.6	0.0	99.1

% Icon	Classes (kph)	19		1.8-6.8	51		6.8-13.6	22		13.6-20.4	5		20.4-27.2	2		27.2-34.0	0		>34.0
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LICA ST. LINA 2018/03/01 00:00 - 2018/03/31 23:00 Calm: 0.94% Calm Wind Avg Speed: 1.33(kph)



WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - March 2018

WIND DIRECTION Hourly Averages (WD)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24-HOUR AVG	24-HR	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	QUADRANT	RDGS.	
DAY																											
1	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
2	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	24
3	E	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	E	E	E	E	E	E	E	E	ESE	ESE	E	E	24
4	E	E	E	E	E	E	E	ESE	SSW	S	S	SSW	SSW	SSW	SSE	SE	SSE	SW	SSW	S	WNW	NW	WNW	WNW	SE	24	
5	NW	NW	NW	NNW	NW	NW	NW	NW	NW	WNW	WNW	NW	NW	WNW	NW	NW	WNW	WNW	NW	WNW	WSW	W	W	WSW	WNW	24	
6	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	WSW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SSW	SSW	SSW	SSW	WSW	24
7	SSW	SW	SW	SSW	SW	SW	WSW	SSW	SSW	SW	SW	SSW	SW	SW	SSW	SSW	SSW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	24
8	SSW	WSW	WNW	WNW	SW	S	S	S	S	SSE	SSE	SSE	SE	ESE	ESE	E	ESE	ESE	SE	SE	ESE	SE	SE	SE	SE	SE	24
9	ESE	SE	SE	ESE	ESE	ESE	E	ESE	ESE	ESE	ESE	S	NW	NW	WNW	WNW	NW	WNW	WSW	SW	WSW	WSW	W	W	S	24	
10	W	WNW	WNW	WSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	WSW	WSW	SW	SW	SW	SW	SW	SW	SSW	SW	SW	SW	24
11	SW	WSW	WSW	SW	SW	SW	SSW	SSW	SSW	SSW	S	SSW	SSW	SW	SSW	SSW	SSW	SSW	SSW	S	S	S	S	S	SSW	SSW	24
12	SSW	SSW	SSW	S	S	SSW	S	S	SSW	SSW	SSW	SSW	SSW	SSW	S	S	S	S	S	S	S	S	S	S	S	S	24
13	SSW	SSW	SSW	SSW	SSW	SSW	SSE	SSE	S	SSW	SSW	SSE	ESE	ESE	E	ESE	E	E	ESE	SE	SE	SE	ESE	ESE	SSE	24	
14	ESE	ESE	E	E	E	E	E	E	ESE	ESE	ESE	SE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	24
15	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	E	ESE	SE	SE	SE	SE	SE	SE	SE	SE	SE	ESE	24
16	ESE	SE	ESE	SE	SE	SSE	SSE	SSE	SSE	SSE	S	SSW	S	S	S	SSW	SSW	SW	SW	SW	SW	SSW	SW	WSW	S	24	
17	W	WNW	WNW	WNW	N	NNE	NE	NNE	NNE	NE	ENE	NE	ENE	ENE	ENE	E	ENE	ESE	SW	NW	N	N	NE	NNE	NNE	24	
18	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	ENE	E	ENE	ENE	24
19	E	ENE	ESE	E	E	ESE	ESE	SE	SSE	S	S	SSW	S	S	SSW	SSW	S	SSW	SSW	S	S	S	S	S	SSW	SSE	24
20	SSW	SSW	SSW	SW	SW	SW	SSW	SSW	SSW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	S	S	S	S	SSW	SSW	SSW	24
21	SSW	SW	SSW	NNE	NE	NE	NE	ENE	ENE	ENE	ENE	ENE	ENE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ENE	ENE	ENE	ENE	24
22	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	ENE	E	E	ENE	ENE	ENE	ENE	E	ENE	E	E	E	E	E	ESE	ESE	ESE	E	24
23	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	ESE	SE	SE	SE	SSE	SSE	SSE	SSW	SW	WSW	SE	SSE	SSE	S	SSE	SSE	SE	24	
24	SSE	ESE	ESE	SSE	S	SSW	SW	WSW	WSW	WNW	NW	WNW	NW	NNW	NW	N	N	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNE	NNW	24
25	NE	NNE	NNE	NE	ENE	E	E	SSE	ESE	ESE	ESE	SE	SSW	SSW	SW	SW	SW	SSE	SE	SSE	E	E	E	E	ESE	24	
26	E	ESE	SSE	S	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	SSW	N	N	NNE	NNE	NE	WSW	24
27	NE	ENE	ENE	E	E	E	E	ENE	ENE	ENE	E	E	ENE	ENE	ENE	NE	N	NNW	NW	NW	NNW	N	NW	ENE	ENE	24	
28	WNW	W	W	WSW	WSW	WSW	WSW	WSW	SW	WSW	WSW	WSW	WNW	WNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NE	ENE	WNW	24
29	ENE	ENE	ENE	ENE	NE	ENE	ENE	ENE	E	E	E	E	E	ESE	SSE	S	SSE	SSE	SSE	SSE	S	S	S	S	ESE	24	
30	S	SSE	SE	E	ENE	ENE	NNE	NNE	NNE	NNE	N	N	NW	NW	NW	NW	NNW	NW	NW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	24
31	WNW	WNW	WNW	WNW	WNW	W	W	W	W	W	W	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	WSW	W	24	

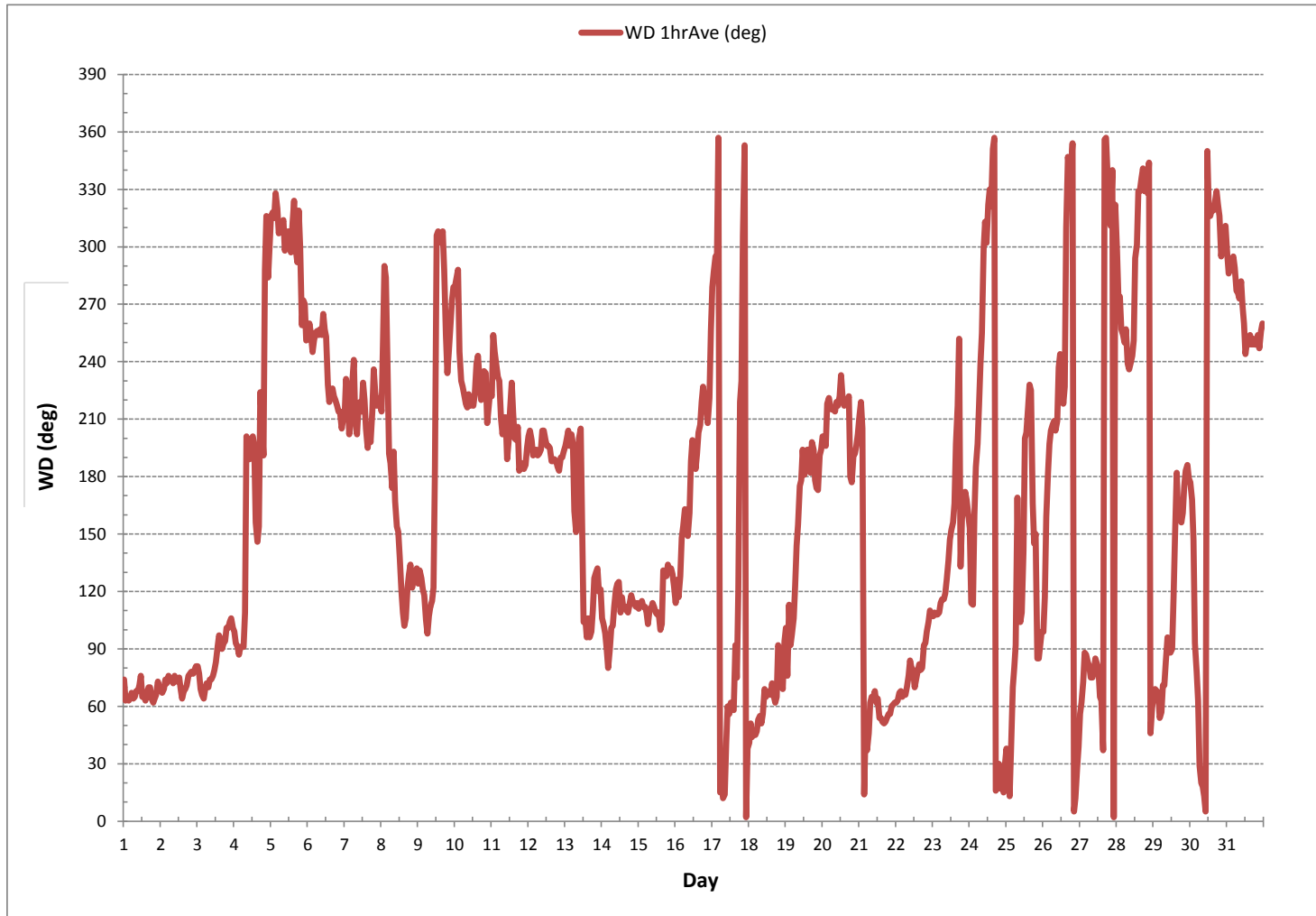
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION:	May 25, 2017
DECLINATION :	MAGNETIC DECLINATION 19 DEGREE EAST

MONTHLY CALIBRATION TIME:	0	hrs	OPERATIONAL TIME:	744	hrs
STANDARD DEVIATION:	87		AMD OPERATION UPTIME:	100.0	%
			MONTHLY AVERAGE:	117 (ESE)	

WIND DIRECTION Hourly Averages (WD)



STANDARD DEVIATION WIND DIRECTION



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - March 2018

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59		
DAY																										
1	8	8	8	7	8	8	10	11	11	12	14	13	13	12	11	11	12	10	10	9	9	10	10	10	24	
2	11	10	10	11	11	11	12	11	10	11	13	14	14	13	12	12	12	11	11	11	12	12	12	12	24	
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4	11	10	10	11	11	10	9	14	11	14	14	14	17	16	20	18	19	12	19	60	18	31	31	42	24	
5	25	15	10	11	11	12	12	13	12	15	14	15	15	20	17	13	20	15	11	14	11	12	7	6	24	
6	5	9	5	6	4	7	4	3	6	9	12	12	14	11	8	6	6	6	7	6	6	7	6	9	24	
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9	13	13	14	13	11	12	12	13	15	15	26	32	21	19	17	18	17	16	8	4	6	5	7	8	24	
10	8	9	10	4	5	2	3	4	4	5	7	6	8	8	10	8	9	6	5	4	6	6	5	4	24	
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13	9	9	7	8	8	8	13	16	15	14	14	30	27	35	21	16	15	11	9	9	11	11	11	10	24	
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17	7	8	9	13	11	7	12	10	10	15	14	13	16	16	15	20	30	32	14	17	13	12	20	10	24	
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19	4	10	7	8	9	10	12	13	15	18	21	16	16	19	15	16	15	12	12	12	10	10	12	11	24	
20	10	10	11	8	6	6	7	7	7	7	8	12	20	16	14	17	11	12	12	9	8	8	8	7	24	
21	4	5	15	60	34	9	10	10	10	11	12	11	13	12	12	11	13	11	11	11	11	11	11	11	24	
22	11	10	11	11	11	11	11	11	12	12	12	12	12	12	11	12	12	12	11	11	11	11	11	12	24	
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30	8	9	12	12	11	10	8	9	15	18	17	20	18	15	15	13	17	13	13	11	11	12	11	24		
31	13	12	12	12	13	11	12	14	17	14	12	9	9	8	11	9	9	7	7	5	4	5	5	24		

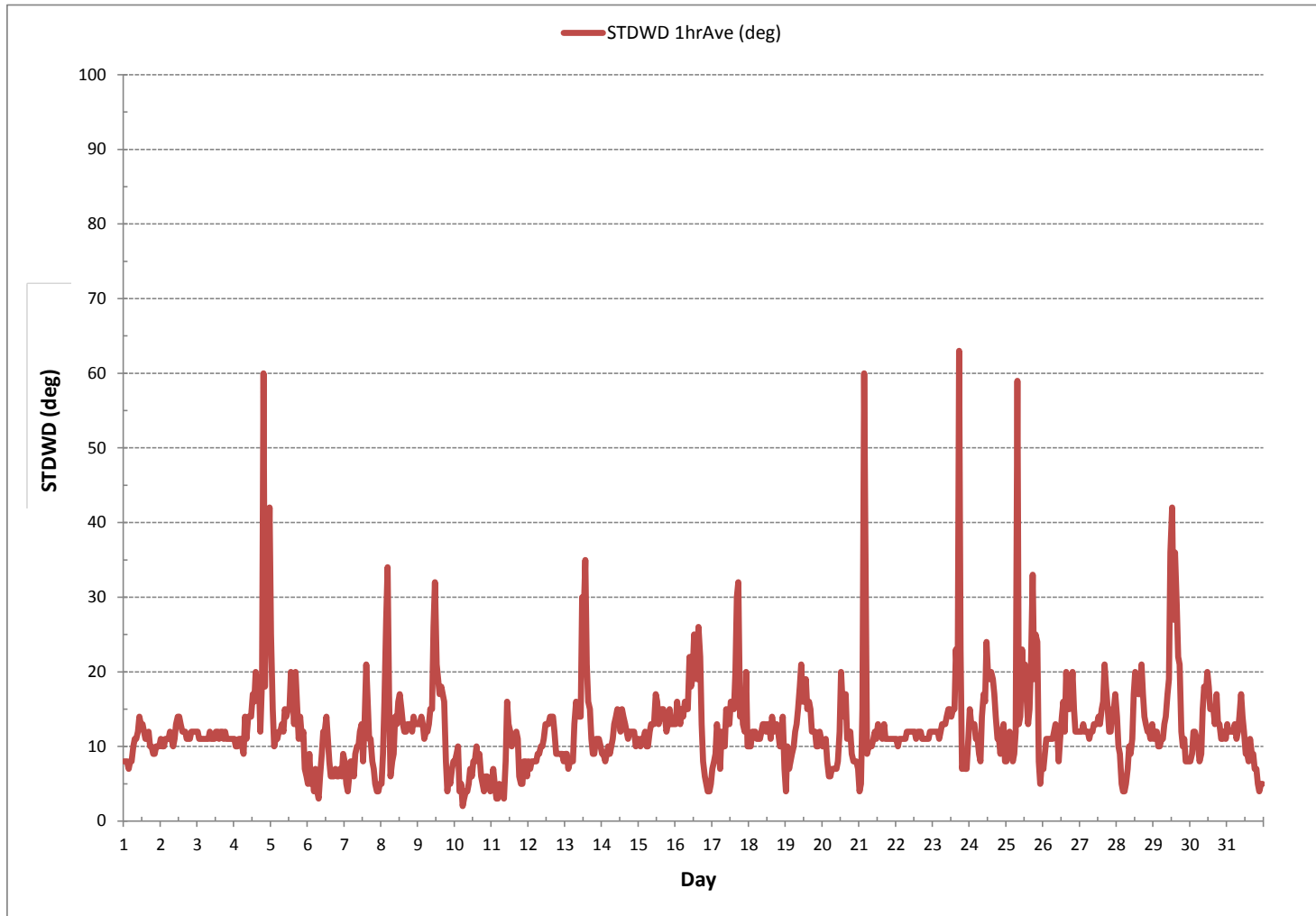
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

LAST CALIBRATION: May 25, 2017

CALIBRATION TIME: 0 hrs OPERATIONAL TIME: 744 hrs

STANDARD DEVIATION WIND DIRECTION Hourly Averages (STDWD deg)



RELATIVE HUMIDITY



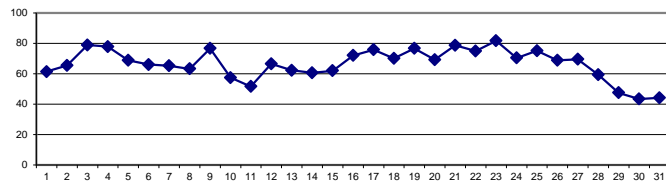
RELATIVE HUMIDITY Hourly Averages (RH %)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.				
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.					
DAY																																
1	70	74	77	80	82	81	79	77	74	65	58	54	50	47	47	43	45	50	54	55	52	51	53	55	43	82	61	24				
2	56	60	64	66	69	71	72	72	73	70	67	64	60	61	62	63	65	66	66	65	65	63	64	56	73	65	24					
3	65	67	69	73	77	78	79	80	80	80	80	79	80	81	81	82	83	83	83	83	83	82	82	82	65	83	79	24				
4	83	84	84	84	84	84	84	83	82	81	80	77	74	73	69	68	69	72	74	76	76	75	76	75	68	84	78	24				
5	76	77	77	77	76	77	78	78	77	74	70	65	56	56	51	59	52	58	67	69	68	69	71	74	51	78	69	24				
6	77	79	78	77	77	76	76	74	68	59	54	50	48	47	47	50	54	59	65	69	73	75	77	75	47	79	66	24				
7	75	76	77	78	77	77	76	76	75	73	71	59	50	49	52	54	54	54	55	57	61	65	69	49	78	65	24					
8	72	76	74	78	78	78	77	75	70	65	54	47	46	44	45	45	50	55	61	65	64	66	67	44	78	63	24					
9	73	74	74	75	77	78	80	81	80	80	80	80	78	76	74	75	69	70	72	78	81	81	79	74	69	81	77	24				
10	70	67	64	71	75	80	80	76	67	58	50	44	39	40	39	39	40	44	49	53	55	58	60	60	39	80	57	24				
11	65	66	70	71	70	70	70	65	51	39	36	36	33	32	33	36	38	42	47	51	56	61	65	32	71	52	24					
12	69	74	77	79	80	81	83	80	72	64	59	57	54	52	52	50	50	54	61	65	68	70	72	74	50	83	67	24				
13	76	78	80	81	81	80	77	72	63	56	51	46	43	42	43	47	48	52	59	60	61	61	65	71	42	81	62	24				
14	73	75	77	79	78	78	77	71	64	57	52	49	46	43	43	41	40	44	50	57	61	63	66	69	40	79	61	24				
15	71	72	74	75	76	77	77	73	68	66	64	57	54	53	51	48	49	51	49	47	48	56	63	68	47	77	62	24				
16	69	70	72	72	74	75	76	76	74	73	72	69	63	65	63	59	64	67	73	76	78	81	83	84	59	84	72	24				
17	83	83	82	81	82	82	81	79	77	72	69	69	71	70	67	66	65	68	75	80	80	81	82	75	65	83	76	24				
18	70	63	64	64	64	66	68	68	70	67	67	66	66	69	71	70	71	74	76	77	75	76	79	82	63	82	70	24				
19	84	84	84	84	84	84	84	84	82	78	75	71	71	71	67	69	68	71	72	73	75	76	76	67	84	77	24					
20	78	81	83	85	84	84	84	84	82	71	52	54	54	51	52	51	53	55	64	67	71	72	73	75	51	85	69	24				
21	76	76	76	78	80	80	80	81	82	80	76	74	72	76	77	76	78	80	81	81	82	82	82	82	72	82	79	24				
22	81	82	82	83	83	83	83	82	81	81	81	80	77	73	69	69	68	68	66	64	64	63	66	67	63	83	75	24				
23	66	69	77	86	86	86	86	85	85	85	86	86	86	86	87	85	78	68	74	80	82	84	84	83	66	87	82	24				
24	80	81	83	77	73	73	71	65	60	76	78	70	70	62	53	53	56	61	68	72	75	76	76	80	53	83	70	24				
25	83	84	82	81	82	82	82	79	76	69	64	63	65	65	69	67	67	66	73	77	79	81	83	84	63	84	75	24				
26	84	85	85	84	84	83	83	83	82	78	69	51	39	38	40	45	59	69	71	72	69	67	66	66	38	85	69	24				
27	65	64	69	75	77	78	78	77	76	75	73	71	69	68	63	57	56	60	63	66	69	74	73	72	56	78	70	24				
28	71	74	72	74	76	75	76	73	67	57	53	54	49	46	47	45	45	53	54	56	52	51	52	53	45	76	59	24				
29	53	55	63	70	65	59	57	49	42	39	35	31	30	31	33	34	36	40	44	48	53	57	58	57	30	70	47	24				
30	56	56	55	57	62	65	67	63	52	41	34	27	27	28	28	29	29	30	34	37	38	39	42	45	27	67	43	24				
31	49	51	53	56	57	55	46	39	35	31	28	33	34	35	33	34	36	43	48	50	51	52	54	28	57	44	24					
HOURLY MAX	84	85	85	86	86	86	86	85	85	85	86	86	86	86	87	85	83	83	83	83	83	84	84	84								
HOURLY AVG	72	73	74	76	76	77	77	74	71	67	63	59	57	56	55	55	56	58	62	65	66	68	69	70								

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

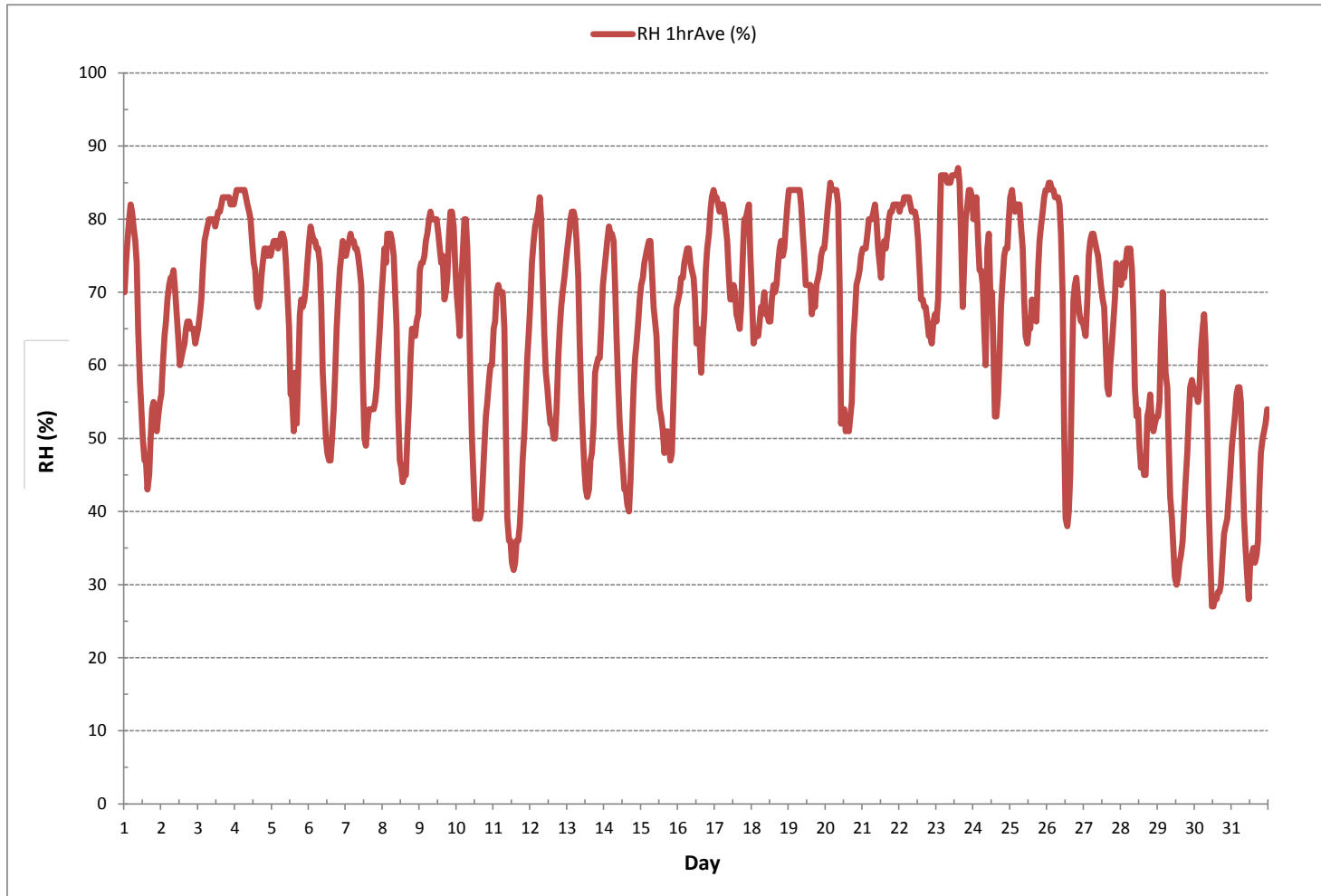
24 HR AVERAGES March 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	27	%	@ HOUR	11	ON DAY	30
MAXIMUM 1-HR AVERAGE:	87	%	@ HOUR	14	ON DAY	23
MAXIMUM 24-HR AVERAGE:	82	%			ON DAY	23
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	14					MONTHLY AVERAGE: 66 %

RELATIVE HUMIDITY Hourly Averages (RH %)



BAROMETRIC PRESSURE



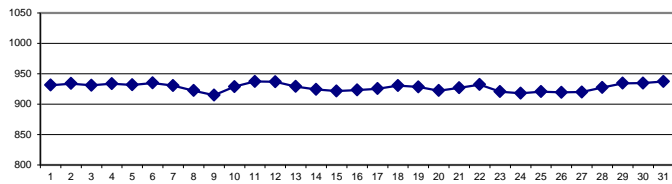
BAROMETRIC PRESSURE Hourly Averages (BP mbar)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	925	926	926	927	927	928	928	929	930	931	932	933	933	933	934	934	934	934	934	933	933	934	934	934	935	925	935	931	24	
2	935	935	934	934	933	933	934	934	933	933	934	934	934	934	934	934	934	934	933	934	934	934	934	933	933	933	933	935	934	24
3	933	933	932	931	931	931	931	930	930	930	930	930	930	930	930	930	930	931	931	931	931	931	932	932	932	930	933	931	24	
4	932	932	932	932	932	932	932	932	933	933	934	935	935	935	935	934	934	934	934	935	935	934	934	935	934	932	935	934	24	
5	933	933	932	932	932	931	931	931	931	931	931	931	931	931	931	931	931	931	932	932	931	932	932	932	933	931	933	932	24	
6	933	933	933	933	934	934	934	934	935	935	936	936	937	937	937	937	937	936	936	935	934	934	933	933	933	933	937	935	24	
7	933	933	932	932	931	931	931	931	931	931	931	932	932	932	932	931	930	929	929	929	928	928	928	927	927	927	933	931	24	
8	927	927	927	926	926	925	925	924	924	924	924	924	924	924	923	922	921	920	919	918	916	916	915	914	914	914	927	922	24	
9	913	913	912	912	911	911	910	911	911	911	913	914	915	915	915	916	917	918	919	919	920	920	921	922	910	922	915	24		
10	922	923	924	924	925	925	926	926	927	928	929	930	931	931	931	932	932	932	932	932	932	932	932	932	933	922	933	929	24	
11	933	933	933	933	934	934	934	935	935	937	938	939	940	941	941	941	940	939	939	939	939	939	938	938	933	922	941	937	24	
12	938	938	938	937	937	937	937	937	937	938	938	939	939	939	939	938	938	938	937	936	935	934	934	933	933	933	939	937	24	
13	932	931	931	930	929	929	929	928	928	929	929	930	930	930	930	930	929	928	927	927	927	927	926	926	926	926	926	929	24	
14	926	926	925	925	925	925	924	924	924	925	925	925	926	926	926	926	926	926	926	926	926	927	927	927	922	921	926	924	24	
15	921	921	920	920	920	920	920	920	920	921	921	922	923	923	923	923	923	922	921	922	922	922	922	922	922	920	923	921	24	
16	921	921	921	921	921	922	922	922	922	923	924	924	925	925	925	926	926	926	926	925	924	924	924	924	924	921	926	923	24	
17	924	924	924	924	924	924	924	924	924	925	925	925	926	926	926	926	926	926	926	926	927	927	927	927	924	927	925	24		
18	927	927	928	928	928	929	929	929	929	930	931	931	932	932	932	932	932	932	932	932	932	932	932	932	931	927	932	930	24	
19	931	931	931	931	930	930	930	930	930	930	930	930	929	928	928	927	927	926	925	925	924	924	924	924	924	924	931	928	24	
20	923	923	922	921	921	921	921	921	921	921	922	923	924	924	924	923	923	923	923	922	922	922	922	922	922	921	924	922	24	
21	922	922	922	923	923	923	924	924	925	925	926	927	928	929	929	930	930	930	931	931	932	932	932	932	922	932	927	24		
22	933	933	933	934	934	934	933	934	934	934	934	934	933	933	932	932	931	930	929	929	928	928	926	926	926	926	934	932	24	
23	925	924	923	922	921	921	920	920	919	919	920	919	919	919	919	920	921	922	921	920	921	920	920	919	919	919	925	921	24	
24	918	917	916	915	915	915	915	916	917	918	918	918	919	920	920	920	920	921	920	919	919	920	920	919	915	921	918	24		
25	919	919	919	919	919	919	919	921	921	921	922	922	922	922	922	923	923	922	922	921	921	920	919	919	919	923	921	24		
26	919	918	918	917	917	917	917	917	917	917	918	919	920	920	920	921	921	921	922	922	923	923	922	921	917	923	919	24		
27	922	921	921	920	920	919	918	918	917	917	917	916	916	917	918	919	920	921	921	922	923	924	925	925	916	925	920	24		
28	926	926	926	926	926	926	926	926	927	927	927	927	928	928	928	928	928	928	928	928	929	929	930	930	926	930	927	24		
29	931	931	932	932	933	934	934	935	936	936	937	937	938	938	937	936	936	936	935	934	933	933	932	931	931	931	938	934	24	
30	931	931	930	930	930	930	931	931	932	933	935	935	936	936	936	937	937	937	937	938	938	939	939	939	930	939	935	24		
31	939	939	940	940	940	940	940	940	940	940	940	939	939	938	937	936	936	934	933	932	932	931	931	931	931	940	937	24		
HOURLY MAX	939	939	940	940	940	940	940	940	940	940	940	939	940	941	941	941	940	940	939	939	939	939	939	939	939	931	940	937	24	
HOURLY AVG	927	927	927	927	927	927	927	927	927	928	928	928	929	929	929	929	929	929	928	928	928	928	928	928	928	931	940	937	24	

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

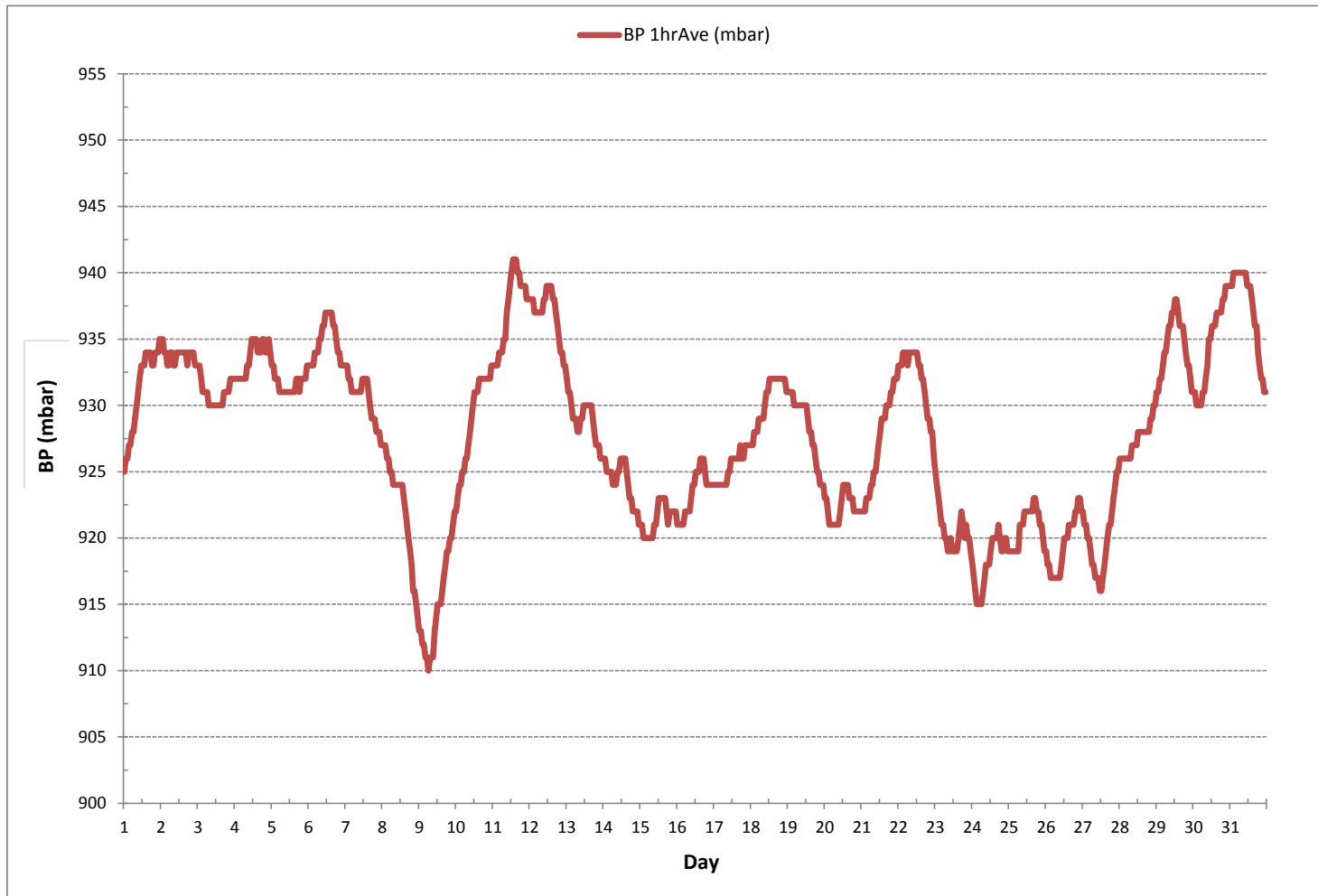
24 HR AVERAGES March 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	910	mbar	@ HOUR	6	ON DAY	9
MAXIMUM 1-HR AVERAGE:	941	mbar	@ HOUR	13	ON DAY	11
MAXIMUM 24-HR AVERAGE:	937	mbar			ON DAY	31
OPERATIONAL TIME:						744 hrs
AMD OPERATION UPTIME:						100.0 %
STANDARD DEVIATION:	7					
MONTHLY AVERAGE:						928 mbar

BAROMETRIC PRESSURE Hourly Averages (BP mbar)



AMBIENT TEMPERATURE



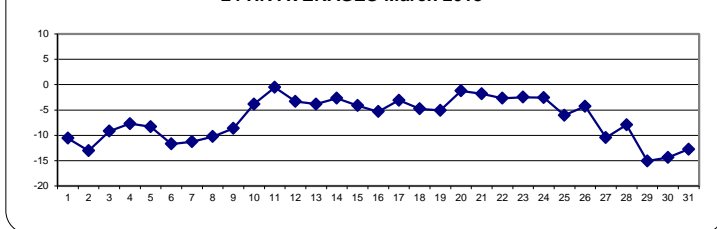
AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY																													
1	-8.0	-9.8	-10.8	-11.6	-12.2	-12.3	-13.2	-14.0	-13.4	-11.0	-9.4	-8.0	-7.4	-7.6	-8.1	-7.4	-8.3	-9.2	-10.7	-11.3	-11.6	-12.0	-12.7	-14.0	-14.0	-7.4	-10.6	24	
2	-14.8	-15.6	-16.3	-16.6	-16.9	-17.2	-17.4	-17.2	-17.0	-15.9	-14.2	-12.3	-10.3	-10.1	-9.9	-9.8	-10.0	-10.4	-10.3	-10.0	-9.7	-10.0	-10.5	-11.0	-17.4	-9.7	-13.1	24	
3	-11.2	-11.4	-11.9	-12.4	-12.7	-12.6	-12.3	-11.8	-10.9	-10.0	-9.0	-7.4	-6.6	-7.2	-7.0	-6.9	-7.0	-7.3	-7.5	-7.5	-7.5	-7.4	-7.4	-7.5	-12.7	-6.6	-9.2	24	
4	-7.5	-7.6	-7.7	-7.9	-8.0	-8.0	-8.1	-8.1	-8.4	-8.1	-7.2	-6.5	-6.3	-6.7	-6.2	-6.4	-6.9	-7.5	-7.8	-8.3	-8.5	-8.8	-9.0	-9.5	-9.5	-6.2	-7.7	24	
5	-9.9	-10.0	-10.5	-10.5	-10.5	-10.9	-11.4	-11.3	-10.8	-10.1	-8.7	-6.6	-6.6	-3.8	-4.1	-2.0	-4.8	-2.7	-5.3	-7.9	-8.2	-8.5	-9.1	-9.9	-11.5	-11.5	-2.0	-8.3	24
6	-13.6	-14.5	-15.6	-16.9	-17.3	-17.0	-17.5	-17.0	-12.9	-10.0	-7.8	-6.0	-4.6	-4.3	-4.6	-5.4	-7.4	-9.2	-11.2	-12.5	-13.5	-13.8	-14.5	-13.9	-17.5	-4.3	-11.7	24	
7	-14.3	-14.8	-15.8	-16.8	-16.6	-16.3	-16.3	-16.0	-14.9	-12.2	-10.3	-6.9	-3.9	-3.4	-4.2	-5.9	-6.6	-8.2	-9.0	-9.4	-10.4	-11.9	-13.0	-13.7	-16.8	-3.4	-11.3	24	
8	-14.8	-15.3	-13.3	-15.7	-15.5	-15.4	-17.4	-16.3	-15.0	-10.5	-7.0	-4.2	-2.7	-2.0	-3.1	-3.7	-5.5	-7.7	-9.3	-10.3	-10.5	-10.2	-10.4	-10.3	-17.4	-2.0	-10.3	24	
9	-10.6	-10.6	-10.6	-11.0	-11.2	-11.3	-11.4	-11.2	-10.3	-9.9	-8.5	-7.3	-6.2	-6.3	-6.3	-6.4	-5.1	-5.5	-6.0	-7.6	-8.3	-8.7	-8.5	-8.3	-11.4	-5.1	-8.6	24	
10	-8.5	-8.1	-7.5	-9.9	-11.1	-12.4	-12.9	-12.2	-9.8	-6.3	-2.2	1.1	3.6	3.7	3.8	3.7	3.6	2.2	0.1	-1.3	-1.9	-2.7	-3.6	-3.7	-12.9	3.8	-3.8	24	
11	-5.0	-5.1	-6.3	-6.7	-6.8	-7.0	-7.1	-5.9	-1.7	2.7	4.3	4.9	5.6	7.0	6.7	6.4	5.5	4.0	1.7	0.0	-1.0	-2.1	-3.1	-4.3	-7.1	7.0	-0.5	24	
12	-5.3	-6.3	-6.9	-7.6	-8.2	-8.5	-9.0	-8.2	-5.6	-3.0	-1.1	0.1	1.4	1.8	2.3	2.6	2.3	1.1	-1.3	-2.7	-3.3	-4.0	-4.8	-5.3	-9.0	2.6	-3.3	24	
13	-5.9	-7.2	-8.1	-8.7	-9.1	-9.4	-9.4	-8.3	-6.6	-4.4	-2.7	-0.2	2.2	3.1	3.1	2.2	1.6	0.1	-2.4	-3.1	-3.7	-4.3	-5.1	-6.4	-9.4	3.1	-3.9	24	
14	-7.2	-7.9	-8.2	-8.5	-8.8	-8.4	-8.0	-6.1	-4.5	-1.9	0.1	1.2	2.5	3.5	3.8	3.7	3.6	1.8	-0.2	-1.5	-2.4	-3.0	-3.8	-4.3	-8.8	3.8	-2.7	24	
15	-4.9	-5.4	-5.8	-6.6	-7.3	-8.1	-8.8	-7.6	-6.1	-5.6	-4.1	-1.0	0.1	0.6	1.2	1.8	0.4	-2.2	-3.6	-3.5	-4.1	-5.3	-6.5	-7.3	-8.8	1.8	-4.2	24	
16	-7.8	-8.4	-8.7	-8.5	-8.5	-8.4	-8.4	-8.0	-7.2	-6.1	-5.3	-4.1	-2.0	-1.8	-1.0	0.5	-1.2	-1.8	-3.9	-4.5	-5.0	-5.8	-6.1	-5.8	-8.7	0.5	-5.3	24	
17	-5.9	-5.8	-5.2	-5.1	-5.5	-5.4	-5.1	-4.7	-4.1	-2.6	-1.9	-1.8	-1.4	-1.2	-0.3	-0.3	-0.2	-1.1	-2.4	-2.9	-2.9	-2.9	-3.1	-2.7	-5.9	-0.2	-3.1	24	
18	-2.9	-3.2	-3.4	-3.8	-4.3	-4.8	-5.4	-5.5	-4.8	-4.2	-4.1	-3.5	-3.5	-3.9	-4.6	-4.3	-4.5	-5.1	-5.6	-5.8	-6.0	-6.5	-7.3	-8.2	-8.2	-2.9	-4.8	24	
19	-8.7	-9.1	-8.1	-7.9	-7.7	-7.3	-7.1	-6.5	-5.4	-4.2	-3.3	-2.2	-2.0	-1.9	-1.8	-1.4	-2.4	-2.9	-4.1	-4.7	-5.2	-5.9	-6.4	-6.4	-9.1	-1.4	-5.1	24	
20	-6.8	-6.9	-7.1	-7.4	-7.5	-7.5	-7.6	-7.2	-6.3	-3.3	3.0	3.7	5.6	7.3	6.2	6.0	5.3	4.0	1.7	0.5	-0.8	-1.1	-1.5	-2.1	-7.6	7.3	-1.2	24	
21	-2.4	-2.1	-2.4	-2.8	-3.4	-3.3	-3.0	-3.2	-2.7	-1.8	-0.3	1.0	1.6	0.8	0.4	0.4	-0.4	-1.3	-2.0	-2.5	-2.9	-3.4	-3.7	-4.1	-4.1	1.6	-1.8	24	
22	-4.5	-4.9	-5.2	-5.4	-5.4	-5.7	-5.9	-5.4	-4.7	-4.0	-3.3	-2.7	-1.9	-0.6	0.6	0.4	0.5	0.4	0.4	0.1	-0.2	-0.6	-1.5	-2.1	-5.9	0.6	-2.7	24	
23	-2.3	-2.5	-3.2	-4.1	-4.2	-4.1	-4.2	-4.1	-3.8	-3.3	-2.7	-2.4	-1.9	-1.6	-0.6	1.0	2.3	0.3	-1.8	-2.7	-3.1	-3.0	-2.9	-4.2	-4.2	2.3	-2.5	24	
24	-2.3	-2.7	-4.1	-3.3	-3.7	-4.3	-4.7	-3.1	-0.4	-2.8	-2.5	-0.6	-0.6	0.9	2.9	2.7	1.1	-0.7	-3.6	-5.2	-6.1	-6.0	-6.0	-7.0	-7.0	2.9	-2.6	24	
25	-7.8	-8.3	-7.8	-8.2	-8.6	-9.2	-9.9	-8.3	-7.3	-6.5	-5.1	-3.9	-3.5	-2.7	-3.1	-2.8	-2.7	-2.5	-4.5	-5.3	-6.2	-6.8	-7.4	-7.3	-9.9	-2.5	-6.1	24	
26	-7.4	-7.5	-7.4	-8.4	-8.9	-9.6	-9.4	-8.7	-7.5	-4.7	-1.4	2.2	5.7	5.1	4.5	4.2	1.6	-2.3	-4.0	-5.6	-7.3	-8.2	-8.8	-9.3	-9.6	5.7	-4.3	24	
27	-10.3	-11.0	-11.3	-11.6	-11.8	-12.0	-12.5	-12.7	-12.2	-11.6	-10.8	-10.3	-9.0	-8.8	-7.9	-7.4	-7.9	-8.9	-9.5	-10.4	-10.7	-10.4	-10.7	-11.1	-12.7	-7.4	-10.5	24	
28	-11.1	-12.6	-13.0	-13.7	-14.0	-14.2	-13.8	-12.6	-9.6	-5.9	-4.2	-3.6	-1.4	-0.7	-1.4	-1.6	-2.2	-4.3	-6.0	-6.9	-7.6	-8.0	-9.8	-12.1	-14.2	-0.7	-7.9	24	
29	-13.6	-15.0	-16.0	-17.8	-18.7	-19.9	-20.1	-18.9	-17.3	-15.8	-13.4	-11.2	-10.0	-10.0	-11.0	-10.8	-11.1	-12.1	-14.1	-15.4	-16.3	-17.5	-17.9	-17.9	-20.1	-10.0	-15.1	24	
30	-17.8	-17.4	-16.8	-17.1	-18.6	-18.7	-18.7	-16.9	-14.0	-11.2	-10.7	-10.1	-9.3	-10.6	-10.5	-11.6	-12.3	-13.7	-14.8	-15.3	-15.8	-16.3	-16.8	-16.8	-18.7	-9.3	-14.4	24	
31	-17.5	-18.5	-18.9	-19.2	-19.3	-19.6	-19.1	-16.4	-13.1	-10.3	-8.4	-7.0	-7.5	-6.8	-7.2	-6.5	-6.9	-7.9	-9.9	-11.8	-12.7	-13.4	-13.7	-14.2	-19.6	-6.5	-12.7	24	
HOURLY MAX	-2.3	-2.1	-2.4	-2.8	-3.4	-3.3	-3.0	-3.1	-0.4	2.7	4.3	4.9	5.8	7.3	6.7	6.4	5.5	4.0	1.7	0.5	-0.2	-0.6	-1.5	-2.1					
HOURLY AVG	-8.7	-9.2	-9.5	-10.1	-10.4	-10.6	-10.8	-10.1	-8.7	-7.0	-5.3	-3.8	-2.5	-2.2	-2.1	-2.2	-2.7	-3.9	-5.4	-6.3	-6.9	-7.4	-7.9	-8.4					

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

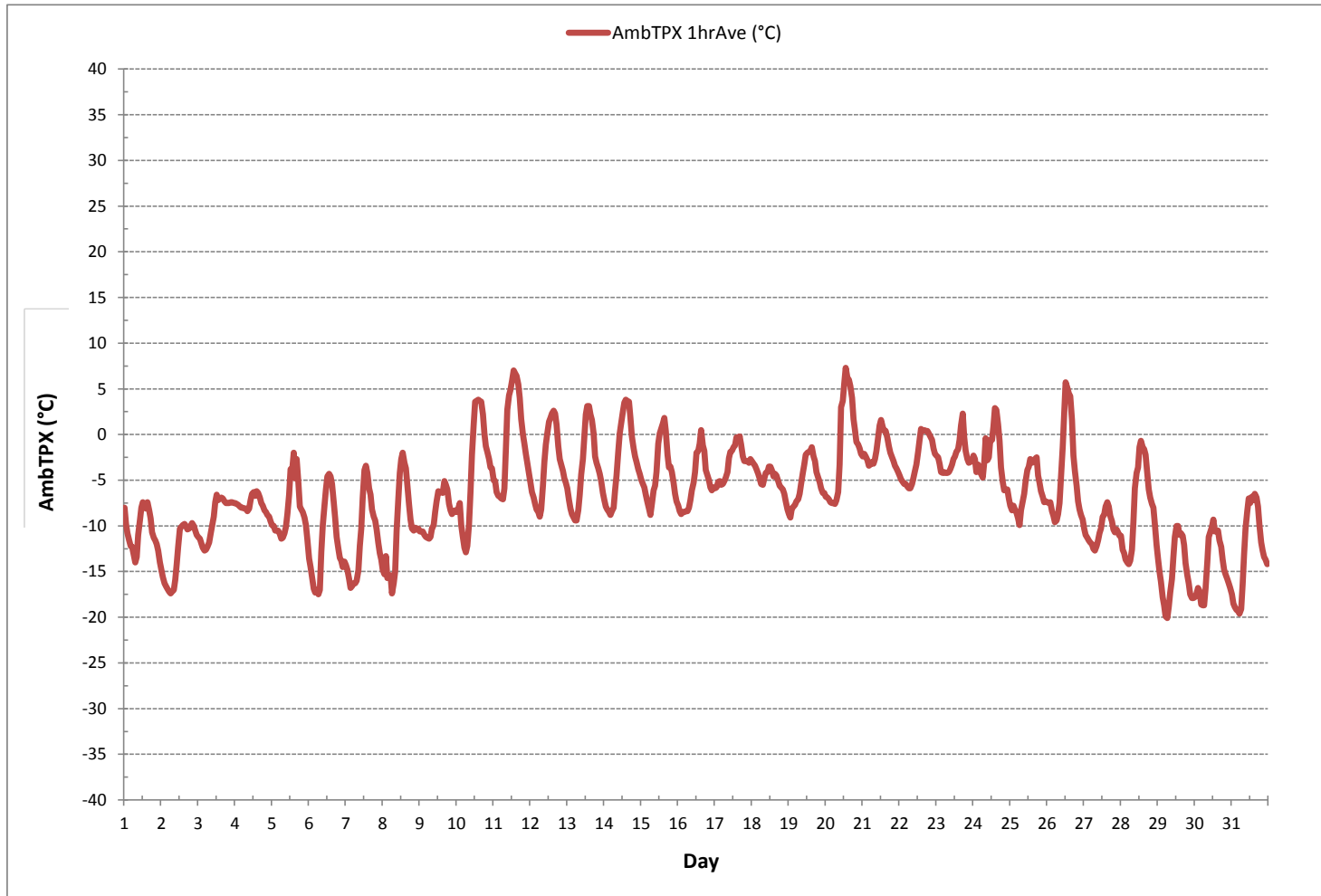
24 HR AVERAGES March 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	-20.1 °C	@ HOUR	6	ON DAY	29
MAXIMUM 1-HR AVERAGE:	7.3 °C	@ HOUR	13	ON DAY	20
MAXIMUM 24-HR AVERAGE:	-0.5 °C			ON DAY	11
OPERATIONAL TIME:					744 hrs
AMD OPERATION UPTIME:					100.0 %
STANDARD DEVIATION:	5.4				MONTHLY AVERAGE: -6.7 °C

AMBIENT TEMPERATURE Hourly Averages (AmbTPX °C)



PRECIPITATION

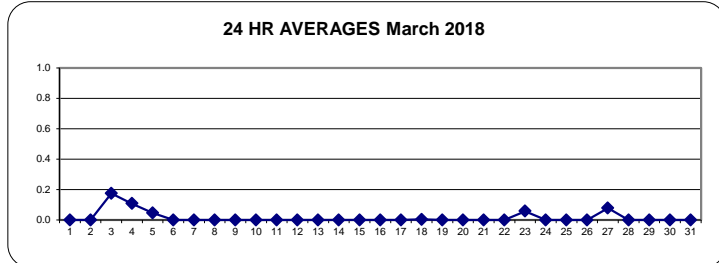
PRECIPITATION Hourly Averages (mm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.6	0.5	0.3	0.2	0.2	0.2	0.1	0.3	0.3	0.3	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.6	0.2	24
4	0.0	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.2	0.1	0.1	0.3	0.4	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	24
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	24
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Q	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	24
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
23	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	24
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
27	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.5	0.2	0.0	0.1	0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	24
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24
HOURLY MAX	0.0	0.2	0.1	0.1	0.2	0.2	0.3	0.5	0.6	0.5	0.3	0.3	0.5	0.8	0.2	0.3	0.3	0.3	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	24
HOURLY AVG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24

STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

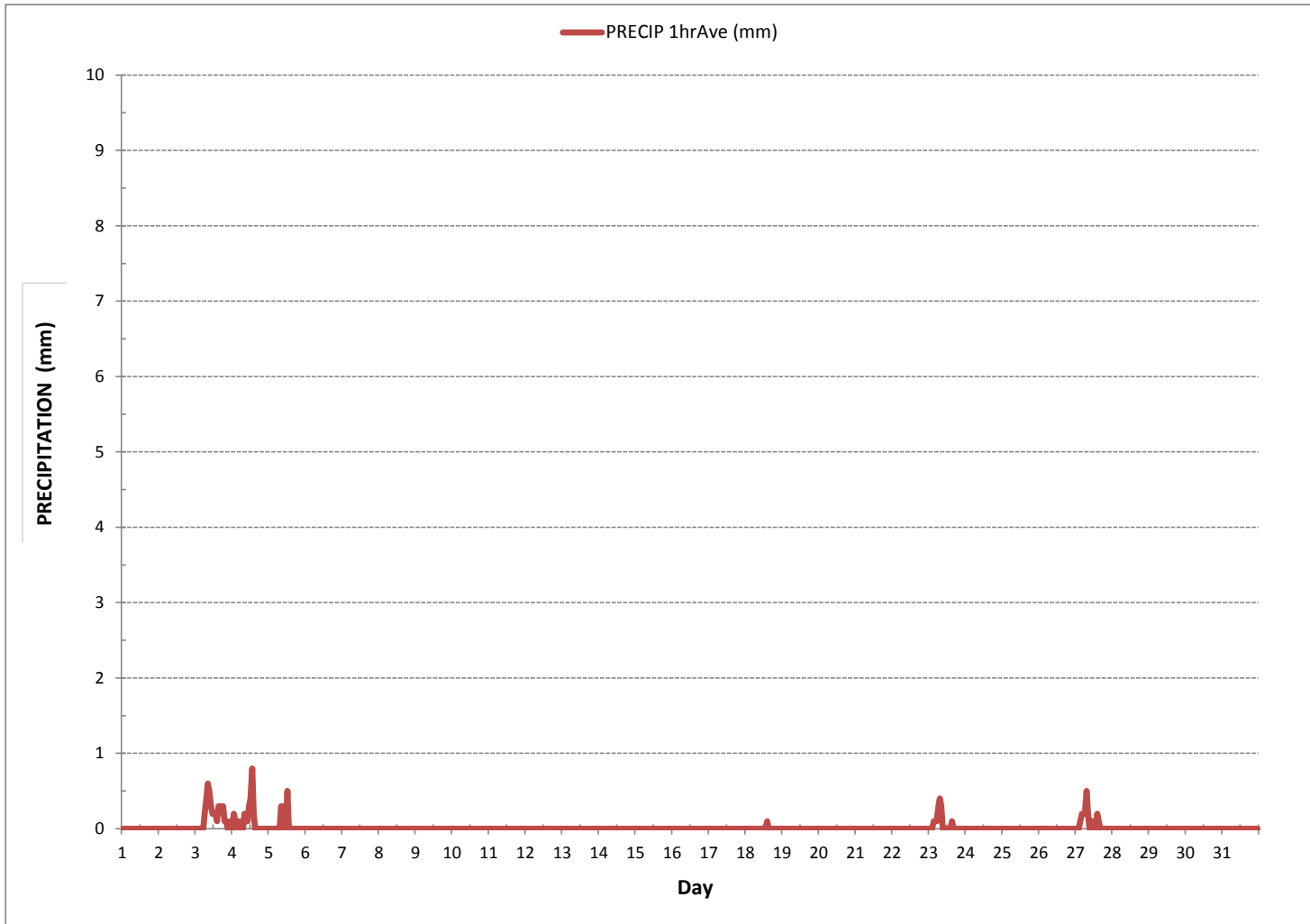
24 HR AVERAGES March 2018



MONTHLY SUMMARY

MINIMUM 1-HR AVERAGE:	0.0	mm	@ HOUR	0	ON DAY	1
MAXIMUM 1-HR AVERAGE:	0.8	mm	@ HOUR	13	ON DAY	4
MAXIMUM 24-HR AVERAGE:	0.2	mm			ON DAY	3
MONTHLY TOTAL	11.3	mm				
			OPERATIONAL TIME:			744 hrs
			AMD OPERATION UPTIME:			100.0 %
STANDARD DEVIATION:	0.1		MONTHLY AVERAGE:			0.0 mm

PRECIPITATION Hourly Averages (mm)



APPENDIX II
EQUIPMENT CALIBRATION RESULTS

SULPHUR DIOXIDE



API 100E Sulphur Dioxide Analyzer Calibration

Date: <u>March 2, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u>	<u>934</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>A few clouds</u>		
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>shut down</u>		
Start Time 24 hr. (mst): <u>11:29</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	<u>Rob Fisher</u>	
End Time 24 hr. (mst): <u>13:34</u>	Cal Gas Expiry Date: <u>October 24, 2020</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>		

Analyzer:	Range ppb: <u>1000</u>
ID# or Serial Number: <u>468</u>	As Found C.F.: <u>0.994</u>
Last Calibration Date: <u>February 14, 2018</u>	New C.F.: <u>n/a</u>
Previous C.F.: <u>1.000</u>	

Calibration Standards: Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u> High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u> Calibrator ID/Expiry Date: <u>API id# 690 expires March 17, 2018</u> Cal Gas Cylinder I.D. #: <u>LL 104225</u> Cal Gas Conc. (ppm): <u>49.2</u>	Standard Calibration Points for Ranges <table border="1" style="margin: auto;"> <tr><th>Point</th><th>ppb</th></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb								
High	780								
Mid	380								
Low	190								

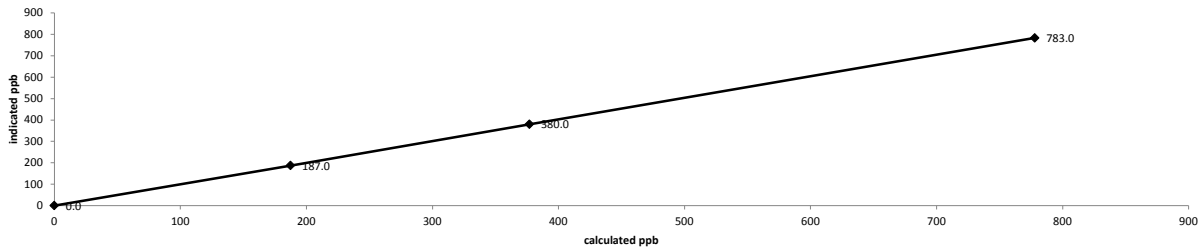
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total			
as found zero	5027	0.00	5027	0.0	0.0	n/a
as found high	4943	79.41	5022	778.0	783.0	0.994
mid	4981	38.46	5019	377.0	380.0	0.992
low	5002	19.13	5021	187.5	187.0	1.002
Average C.F.=						0.996

Linear Regression/Calibration Results:

Correlation Coefficient =	<u>1.000</u>	LIMITS	<u>> or = 0.995</u>
Slope =	<u>0.993</u>		<u>0.90-1.10</u>
b (Intercept as % of full scale)=	<u>0.05%</u>		<u>± 3% F.S.</u>
% change in C.F. from last cal=	<u>0.64%</u>		<u>± 10%</u>

API 100E Sulphur Dioxide Analyzer Calibration



As found: Slope: <u>0.974</u> Offset: <u>145.6</u> Hvps: <u>651</u> Rcell Temp: <u>50.0</u> Box Temp: <u>30.1</u> Pmt Temp: <u>7.9</u> Izs Temp: <u>45.0</u> Pres: <u>24.1</u> Samp Fl: <u>610</u> Norm Pmt: <u>144.5</u> Uv Lamp: <u>2827.6</u> Lamp Ratio: <u>89.8</u> Str Lgt: <u>70.9</u> Drk Pmt: <u>6.0</u> Expected Value: <u>507.0</u>	As left: Slope: <u>n/a</u> Offset: <u>n/a</u> Hvps: <u>n/a</u> Rcell Temp: <u>n/a</u> Box Temp: <u>n/a</u> Pmt Temp: <u>n/a</u> Izs Temp: <u>n/a</u> Pres: <u>n/a</u> Samp Fl: <u>n/a</u> Norm Pmt: <u>n/a</u> Uv Lamp: <u>n/a</u> Lamp Ratio: <u>n/a</u> Str Lgt: <u>n/a</u> Drk Pmt: <u>n/a</u> Expected Value: <u>n/a</u>
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Comments:

The manifold blower was found to be working normally.

A "Shutdown" calibration was performed to correct the output voltage and rebuild the sample pump.



API 100E Sulphur Dioxide Analyzer Calibration

Date: <u>March 2, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u>	<u>934</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>A few clouds</u>		
Parameter: <u>Sulphur Dioxide</u>	Calibration Purpose: <u>post repair</u>		
Start Time 24 hr. (mst): <u>14:05</u>	Performed By/Reviewer: <u>Alex Yakupov</u>	Rob Fisher	
End Time 24 hr. (mst): <u>17:11</u>	Cal Gas Expiry Date: <u>October 24, 2020</u>		
Calibration Method: <u>Gas Dilution</u>	Converter Model & s/n (if applicable): <u>n/a</u>		

Analyzer:	
ID# or Serial Number: <u>468</u>	Range ppb: <u>1000</u>
Last Calibration Date: <u>February 14, 2018</u>	As Found C.F.: <u>n/a</u>
Previous C.F.: <u>n/a</u>	New C.F.: <u>1.000</u>

Calibration Standards:		Standard Calibration Points for Ranges								
Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u>		<table border="1" style="margin: auto;"> <tr><td>Point</td><td>ppb</td></tr> <tr><td>High</td><td>780</td></tr> <tr><td>Mid</td><td>380</td></tr> <tr><td>Low</td><td>190</td></tr> </table>	Point	ppb	High	780	Mid	380	Low	190
Point	ppb									
High	780									
Mid	380									
Low	190									
High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u>										
Calibrator ID/Expiry Date: <u>API id# 690 expires March 17, 2018</u>										
Cal Gas Cylinder I.D. #: <u>LL 104225</u>										
Cal Gas Conc. (ppm): <u>49.2</u>										

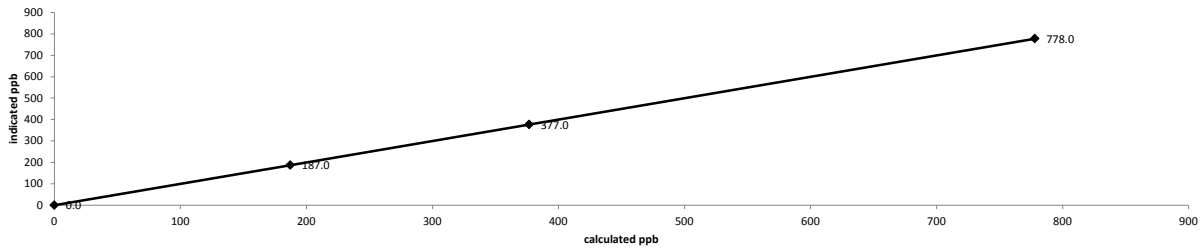
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppb):	Indicated Concentration (ppb):	Correction Factors (C.F.):
	Diluent	Cal Gas	Total			
adjusted zero	5026	0.00	5026	0.0	0.0	n/a
adjusted high	4935	79.28	5014	777.9	778.0	1.000
mid	4982	38.44	5020	376.7	377.0	0.999
low	5001	19.10	5020	187.2	187.0	1.001
calibrator zero	5026	0.00	5026	0.0	0.0	n/a
Average C.F.=						1.000

Linear Regression/Calibration Results:

		LIMITS
Correlation Coefficient =	<u>1.000</u>	> or = 0.995
Slope =	<u>1.000</u>	0.95-1.05
b (Intercept as % of full scale)=	<u>0.00%</u>	± 3% F.S.
% change in C.F. from last cal=	<u>n/a</u>	n/a

API 100E Sulphur Dioxide Analyzer Calibration



<p style="text-align: center;">As found:</p> Slope: <u>n/a</u> Offset: <u>n/a</u> Hvps: <u>n/a</u> Rcell Temp: <u>n/a</u> Box Temp: <u>n/a</u> Pmt Temp: <u>n/a</u> Izs Temp: <u>n/a</u> Pres: <u>n/a</u> Samp Fl: <u>n/a</u> Norm Pmt: <u>n/a</u> Uv Lamp: <u>n/a</u> Lamp Ratio: <u>n/a</u> Str Lgt: <u>n/a</u> Drk Pmt: <u>n/a</u> Expected Value: <u>n/a</u>	<p style="text-align: center;">As left:</p> Slope: <u>0.972</u> Offset: <u>144.5</u> Hvps: <u>651</u> Rcell Temp: <u>50.0</u> Box Temp: <u>30.0</u> Pmt Temp: <u>7.9</u> Izs Temp: <u>45.0</u> Pres: <u>21.4</u> Samp Fl: <u>610</u> Norm Pmt: <u>145.5</u> Uv Lamp: <u>2828.3</u> Lamp Ratio: <u>89.8</u> Str Lgt: <u>70.2</u> Drk Pmt: <u>6.0</u> Expected Value: <u>503.0</u>
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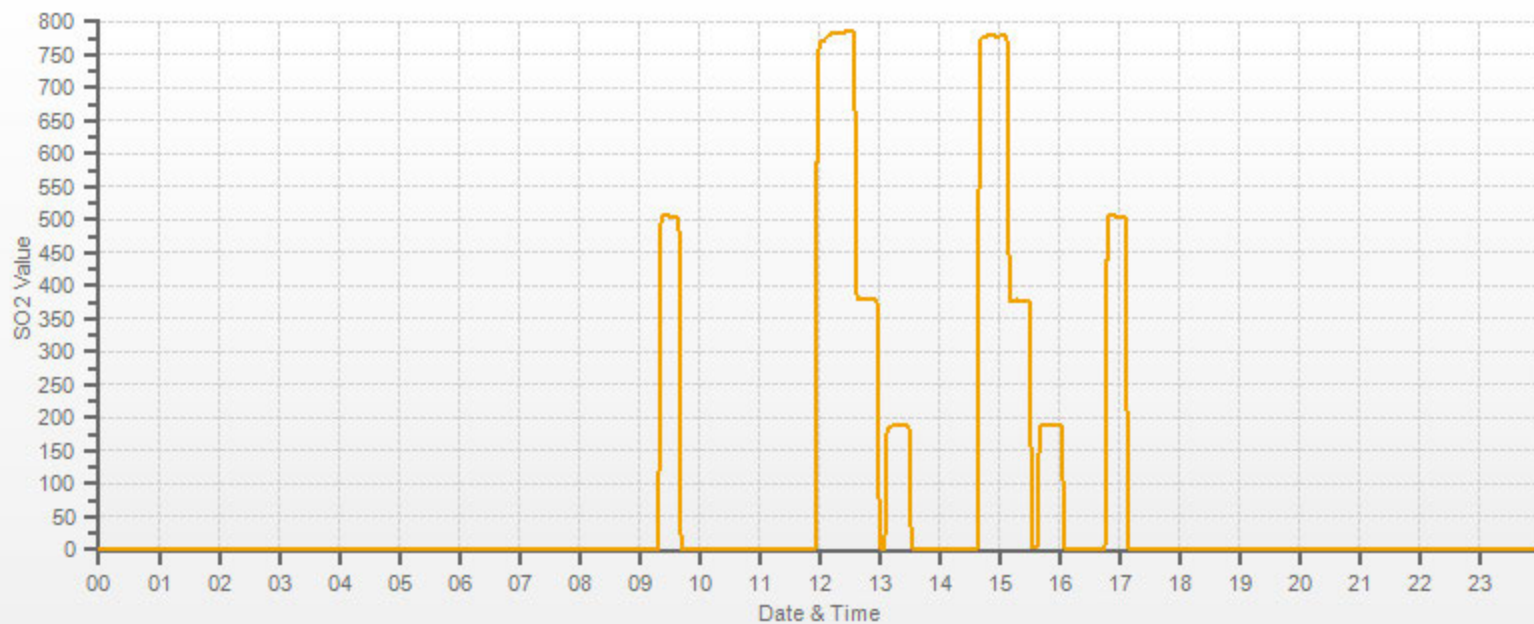
Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

A "Post-Repair" calibration was performed after the output voltage was calibrated and the sample pump was rebuilt.

— SO2[ppb]



HYDROGEN SULPHIDE



API 101E Hydrogen Sulphide Analyzer Calibration

Date:	March 5, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	931	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Light snow		
Parameter:	Hydrogen Sulphide	Calibration Purpose:	routine monthly		
Start Time 24 hr. (mst):	15:41	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
End Time 24 hr. (mst):	19:42	Cal Gas Expiry Date:	June 14, 2019		
Calibration Method:	Gas Dilution	Converter Model & s/n (if applicable):	n/a		

Analyzer:	ID# or Serial Number:	509	Range ppb:	100
	Last Calibration Date:	February 13, 2018	As Found C.F.:	1.022
	Previous C.F.:	1.000	New C.F.:	1.000

Calibration Standards:	Standard Calibration Points for Ranges	SO2 Scrubber Check (10 minutes):
Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	Start/End Time 24 hr.:
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018	SO2 Analyzer Range:
Calibrator ID/Expiry Date:	API id# 690 expires March 17, 2018	Target Concentration (ppb):
Cal Gas Cylinder I.D. #:	EY 0000654	As Found Zero:
Cal Gas Conc. (ppm):	10.2	Analyzer Response: (ppb):
		Zero Corrected Result (ppb):

Point	ppb
High	78
Mid	38
Low	19

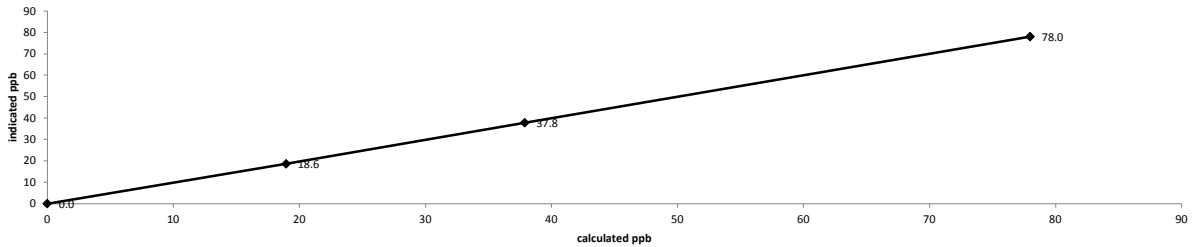
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Calibrator Flow Rates (cc/min)				Calculated	Indicated Concentration (ppb):	Correction Factors (C.F.):
Point	Diluent	Cal Gas	Total	Concentration (ppb):		
as found zero	7575	0.00	7575	0.0	0.0	n/a
as found high	7512	57.88	7570	78.0	76.3	1.022
adjusted zero	7575	0.00	7575	0.0	0.0	n/a
adjusted high	7512	57.88	7570	78.0	78.0	1.000
mid	7546	28.13	7574	37.9	37.8	1.002
low	7565	14.08	7579	18.9	18.6	1.019
calibrator zero	7575	0.00	7575	0.0	0.0	n/a
Average C.F. =						1.007

Linear Regression/Calibration Results:

	LIMITS
Correlation Coefficient =	1.000 > or = 0.995
Slope =	0.998 0.95-1.05
b (Intercept as % of full scale) =	0.16% ± 3% F.S.
% change in C.F. from last cal =	-2.21% ± 10%

API 101E Hydrogen Sulphide Analyzer Calibration



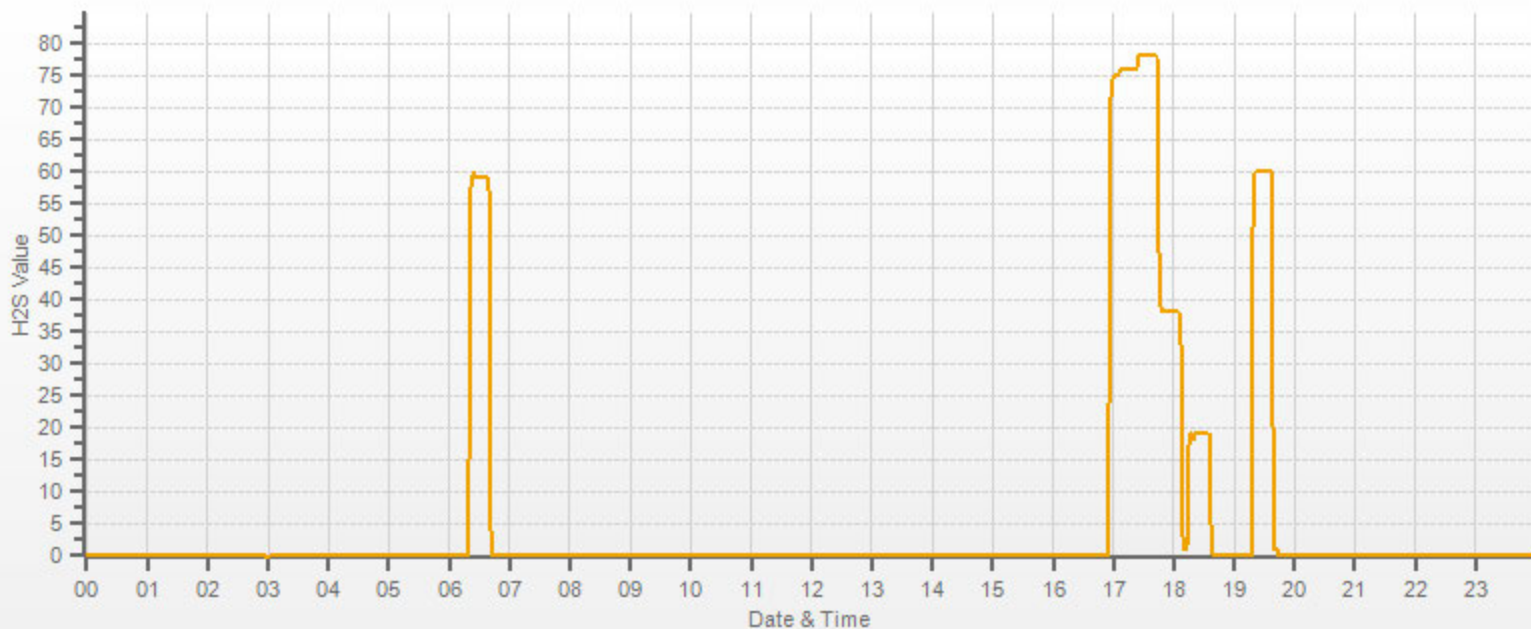
As found:	As left:
Slope: 0.887	Slope: 0.904
Offset: 70.7	Offset: 70.2
Hvps: 671	Hvps: 671
Rcell Temp: 50.0	Rcell Temp: 50.0
Box Temp: 34.1	Box Temp: 34.0
Pmt Temp: 8.0	Pmt Temp: 8.0
Izs Temp: 48.0	Izs Temp: 48.0
Converter Temp: 315.5	Converter Temp: 314.0
Pres: 20.4	Pres: 20.4
Samp Fl: 523	Samp Fl: 523
Uv Lamp: 3201.0	Uv Lamp: 3200.0
Lamp Ratio: 95.5	Lamp Ratio: 95.5
Str Lgt: 31.3	Str Lgt: 31.8
Drk Pmt: 0.7	Drk Pmt: 0.8
Expected Value: 62.5	Expected Value: 60.1

Comments:

The analyzer sample inlet filter was changed.

The manifold blower was found to be working normally.

— H2S[ppb]



TOTAL HYDROCARBON



Thermo 51C Total Hydrocarbon Analyzer Calibration

Date:	March 5, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	931	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	22	°C
Location/Station Name:	St. Lina	Weather Conditions:	Light snow		
Parameter:	Total Hydrocarbon	Calibration Purpose:	shut down		
Start/End Time 24 hr. (mst):	12:49 / 14:55	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 24, 2022		

Analyzer:	
ID# or Serial Number:	436609739
Range ppm:	50
Last Calibration Date:	February 16, 2018
As Found C.F.:	1.001
Previous Cal High Point C.F.:	1.000
New C.F.:	n/a

Calibration Standards:	
Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018
High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018
Calibrator ID/Expiry Date:	API id# 690 expires March 17, 2018
Cal Gas Cylinder I.D. #:	LL 165367
CH ₄ /C ₃ H ₈ Cylinder Conc. (ppm):	590.0 207.0
CH ₄ as propane/total CH ₄ equivalents (ppm):	569.3 1159.3
Standard Calibration Points for a Range of: 50 ppm	
Point	Target ppm
High	38
Mid	18
Low	9

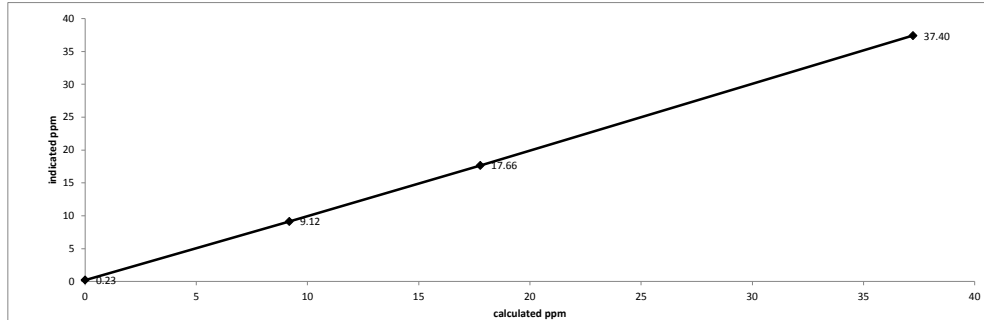
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors
	Diluent	Cal Gas	Total			
as found zero	2500	0.00	2500	0.0	0.23	n/a
as found high	2501	82.97	2584	37.22	37.40	1.001
mid	2510	39.07	2549	17.77	17.66	1.019
low	2511	20.04	2531	9.18	9.12	1.032
Average C.F. =						1.018

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	1.000		0.90-1.10
b (Intercept as % of full scale) =	-0.10%		± 3% F.S.
% change in C.F. from last cal =	-0.14%		± 10%

Thermo 51C Total Hydrocarbon Analyzer Calibration



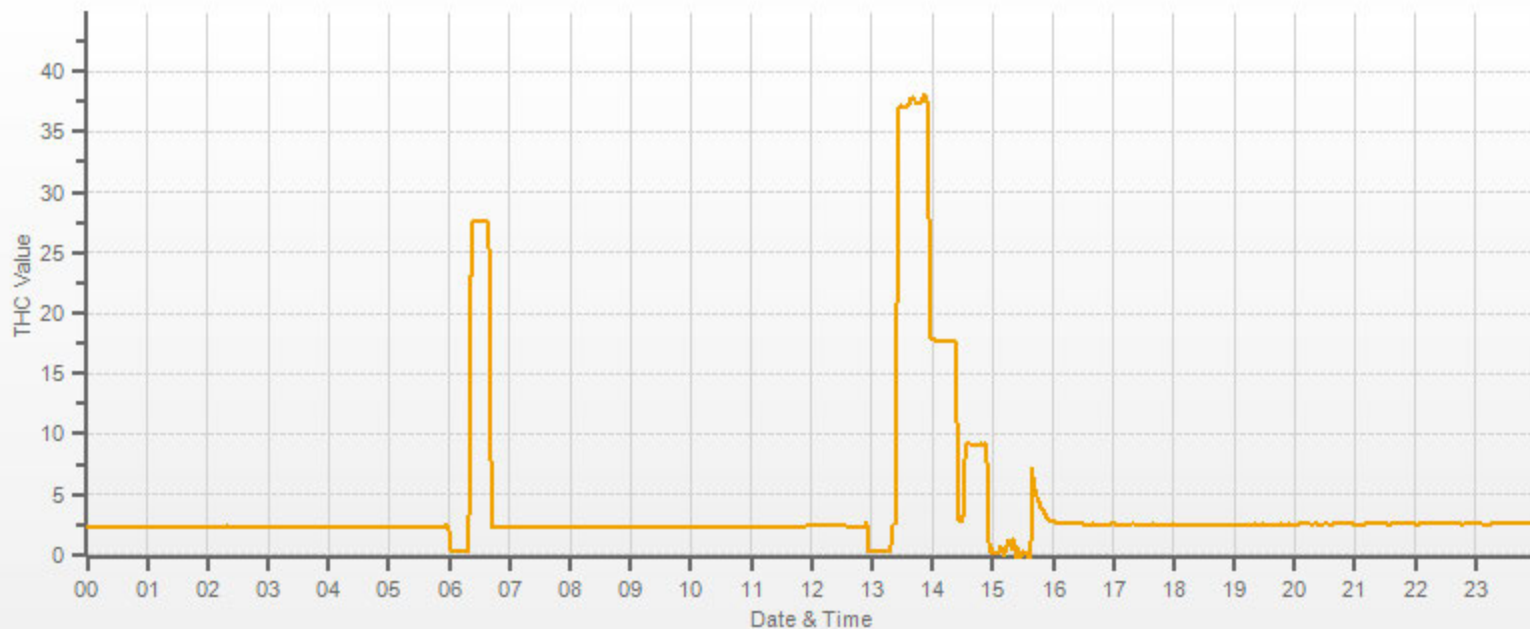
As found:	As left:
H2 cylinder (psi): 500	H2 cylinder (psi): n/a
H2 cylinder reg set (psi): 22	H2 cylinder reg set (psi): n/a
Span Cylinder (psi): 1700	Span Cylinder (psi): n/a
Span Cylinder Reg Set (psi): 22	Span Cylinder Reg Set (psi): n/a
Zero Air Gen Pressure: 44	Zero Air Gen Pressure: n/a
measurement alarms: None	measurement alarms: n/a
service alarms: None	service alarms: n/a
cnt: 3389	cnt: n/a
rng: 1	rng: n/a
try: 3	try: n/a
flm: 207.1	flm: n/a
det: 125.6	det: n/a
Flame: 207	Flame: n/a
Filter: 125	Filter: n/a
Base: 125	Base: n/a
Sample psi: 06.83	Sample psi: n/a
Internal Air Pressure: 20	Internal Air Pressure: n/a
Internal Fuel Pressure: 13	Internal Fuel Pressure: n/a
Measured Flow: 0.9328	Measured Flow: n/a
Expected Value: 27.60	Expected Value: n/a

Comments:

No zero adjustment was required/made.
 No high point adjustment was required/made.
 The manifold blower was found to be working normally.

A "Shutdown" calibration was completed to replace the LICA Analyzer #436609739 because of an unstable Zero reading.

— THC[ppm]





Thermo 51i Total Hydrocarbon Analyzer Calibration

Date:	March 6, 2018	Barometer/B.P./units:	F.S. 05544 expires January 5, 2019	936	millibars
Company/Airshed:	LICA	Thermometer/Station Temp:	F.S. 170286131 expires April 19, 2019	23	°C
Location/Station Name:	St. Lina	Weather Conditions:	Mainly sunny		
Parameter:	Total Hydrocarbon	Calibration Purpose:	Installation		
Start/End Time 24 hr. (mst):	10:12 / 14:07	Performed By/Reviewer:	Alex Yakupov	Rob Fisher	
Calibration Method:	Gas Dilution	Cal Gas Expiry Date:	November 24, 2022		

Analyzer:	ID# or Serial Number:	925436893	Range ppm:	50
	Last Calibration Date:	n/a	As Found C.F.:	n/a
	Previous Cal High Point C.F.:	n/a	New C.F.:	0.998

Calibration Standards:	Low Flow Meter ID/Expiry Date:	Defender Low 152019 expires December 13, 2018	Standard Calibration Points for a Range of:	50 ppm
	High Flow Meter ID/Expiry Date:	Defender High 148944 expires December 13, 2018		
	Calibrator ID/Expiry Date:	API id# 690 expires March 17, 2018		
	Cal Gas Cylinder I.D. #:	LL 165367		
	CH ₄ /C ₂ H ₆ Cylinder Conc. (ppm):	590.0 207.0		
	CH ₄ as propane/total CH ₄ equivalents (ppm):	569.3 1159.3		

Point	Target ppm
High	38
Mid	18
Low	9

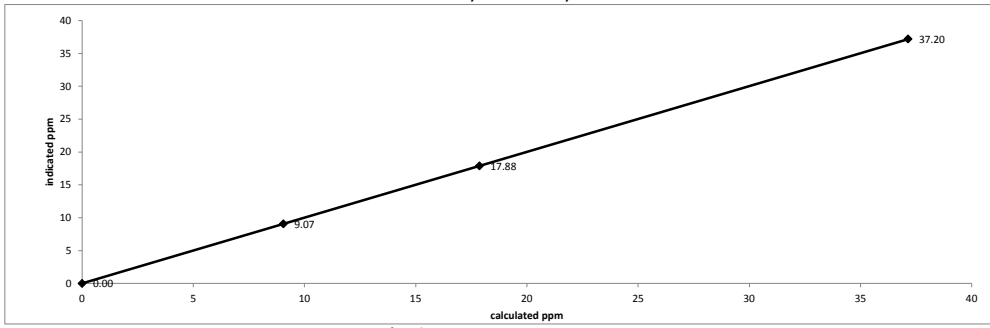
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rates (cc/min)			Calculated Concentration (ppm)	Indicated Concentration (ppm)	Correction Factors
	Diluent	Cal Gas	Total			
adjusted zero	2527	0.00	2527	0.0	0.00	n/a
adjusted high	2528	83.68	2612	37.14	37.20	0.998
mid	2531	39.63	2571	17.87	17.88	0.999
low	2533	19.94	2553	9.05	9.07	0.998
calibrator zero	2527	0.00	2527	0.00	0.00	n/a
Average C.F.=						0.999

Linear Regression/Calibration Results:

Correlation Coefficient =	1.000	LIMITS	> or = 0.995
Slope =	0.998		0.95-1.05
b (Intercept as % of full scale) =	0.01%		± 3% F.S.
% change in C.F. from last cal =	n/a		n/a

Thermo 51i Total Hydrocarbon Analyzer Calibration

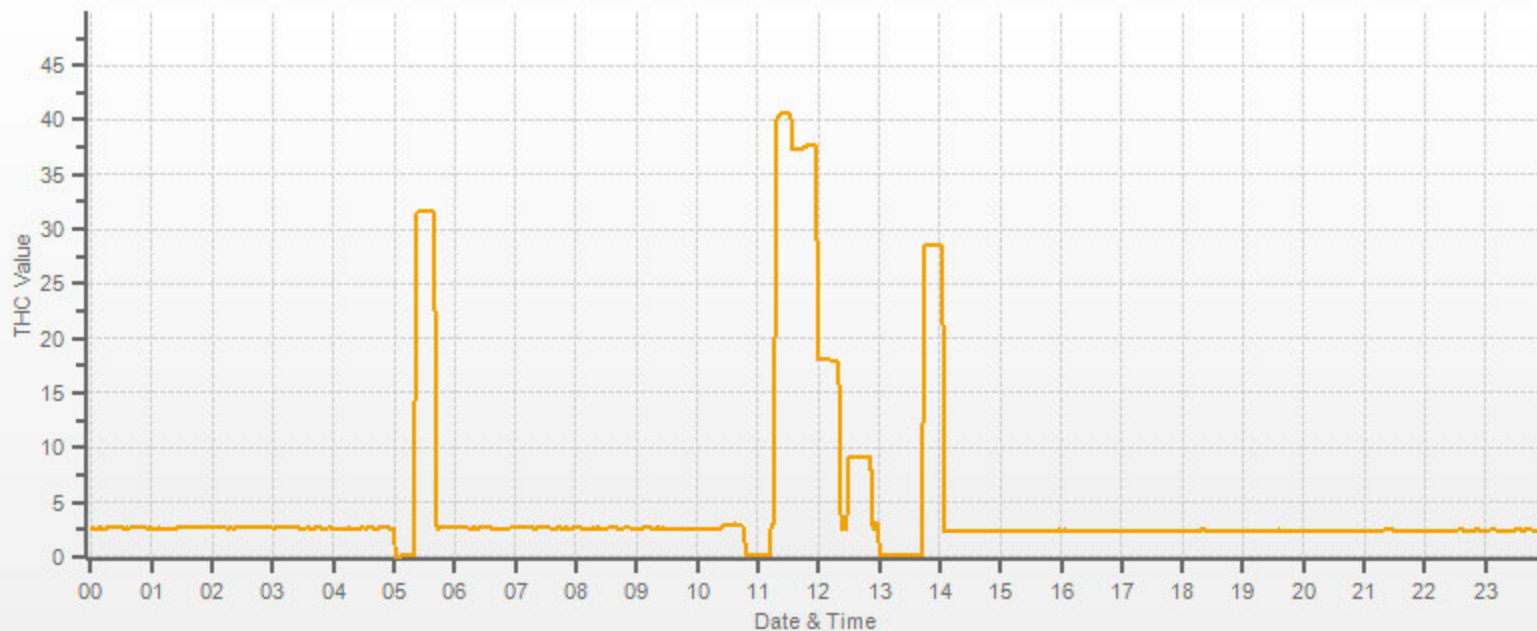


As found:	As left:
Bkg: n/a	Bkg: 3.91
Coef: n/a	Coef: 3.562
H2 cylinder (psi): n/a	H2 cylinder (psi): 500
H2 cylinder reg set (psi): n/a	H2 cylinder reg set (psi): 50
Span Cylinder (psi): n/a	Span Cylinder (psi): 1700
Span Cylinder Reg Set (psi): n/a	Span Cylinder Reg Set (psi): 22
Zero Air Gen Pressure: n/a	Zero Air Gen Pressure: 44
Bias Supply: n/a	Bias Supply: -298.6
Detector Base: n/a	Detector Base: 125.0
Filter: n/a	Filter: 125.0
Pump: n/a	Pump: n/a
Flame: n/a	Flame: 142.1
Internal: n/a	Internal: 32.3
Sample: n/a	Sample: 9.7
Fuel: n/a	Fuel: 19.9
Air: n/a	Air: 39.8
Signal: n/a	Signal: 931
Status: n/a	Status: LIT
Measured Flow: n/a	Measured Flow: 0.8434
Expected Value: n/a	Expected Value: 28.50

Comments:
 The analyzer sample inlet filter was changed.
 The analyzer cooling fan filter(s) were cleaned. The manifold blower was found to be working normally.

An "Installation" calibration was performed for the Maxxam Analyzer #925436893 which replaced the LICA Analyzer #436609739

— THC[ppm]



NITROGEN DIOXIDE



API 200A NO-NO2-NOx Analyzer Calibration

Date: <u>March 1, 2018</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u>	<u>932</u>	millibars
Company/Airshed: <u>LICA</u>	Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u>	<u>22</u>	°C
Location/Station Name: <u>St. Lina</u>	Weather Conditions: <u>Mix of sun and clouds</u>		
Start/End Time 24 hr. (mst): <u>10:50 / 17:27</u>	Calibration Purpose: <u>installation</u>		
G.P.T. to be used for Ozone? <u>No</u>	Performed By/Reviewer: <u>Alex Yakupov</u> / <u>Rob Fisher</u>		
Calibration Method: <u>Gas Dilution & Gas Phase Titration</u>	Cal Gas Expiry Date: <u>October 24, 2020</u>		

Analyzer:		Correction Factors:		
ID# or Serial Number: <u>1746</u>		Previous C.F.:	As Found C.F.:	New C.F.:
Last Calibration Date: <u>n/a</u>		NO = <u>n/a</u>	NO ₂ = <u>n/a</u>	NOx = <u>1.000</u>
Range ppb: <u>1000</u>		NO ₂ = <u>n/a</u>	NOx = <u>n/a</u>	NOx = <u>1.000</u>

Calibration Standards:		Standard Calibration Points for a Range of: <u>1000 ppb</u>			
Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u>		Point	Target NO (ppb)	Target NO ₂ (ppb)	Cc Ozone ?
High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u>		High	<u>780</u>	<u>500</u>	<u>n/a</u>
Calibrator ID/Expiry Date: <u>API id# 690 expires March 17, 2018</u>		Mid	<u>380</u>	<u>275</u>	<u>n/a</u>
Cal Gas Cylinder I.D. #: <u>LL104225</u>		Low	<u>190</u>	<u>100</u>	<u>n/a</u>
Cal Gas Conc. (ppm): <u>51.5</u> / <u>51.6</u>		Extra Point #1	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>
		Extra Point #2	<u>n/a</u>	<u>n/a</u>	<u>n/a</u>

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015									
Calibrator Flow Rates (cc/min)				Calculated NO	Calculated NOx	Indicated NO	Indicated NOx	NO C.F.	NOx C.F.
Point	Diluent	Cal Gas	Total Flow	(ppb)	(ppb)	(ppb)	(ppb)		
adjusted zero	5030	0.0	5030	0	0	0.0	0.0	n/a	n/a
adjusted high	4956	75.8	5032	775.7	777.2	776.0	777.0	1.000	1.000
mid	4993	36.85	5030	377.3	378.0	372.0	372.0	1.014	1.016
low	5011	18.39	5029	188.3	188.7	183.0	183.0	1.029	1.031
calibrator zero	5030	0.00	5030	0.0	0.0	0.0	0.0	n/a	n/a
								Average C.F.=	1.014

ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015										
Calibrator Flow Rates (cc/min)				Calibrator Setting	Indicated NO	Indicated NOx	Indicated NO ₂	NO drop	NO ₂ gain	NO ₂ C.F.
Point	Diluent	Cal Gas	Total Flow	volts or ppb	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
NOx reference	4956	75.79	5032	0.0	777.0	777.0	0.0	0.0	0.0	
adjusted high NO2	4956	75.79	5032	480.0	257.0	777.0	520.0	520.0	520.0	1.000
gpt mid	4956	75.79	5032	255.0	491.0	777.0	286.0	286.0	286.0	1.000
gpt low	4956	75.79	5032	85.0	677.0	777.0	100.0	100.0	100.0	1.000
									Average NO ₂ C.F.=	1.000

Linear Regression/Calibration Results:			
	NO	NOx	NO ₂
Correlation Coefficient =	1.000	1.000	1.000
Slope =	0.998	0.998	1.000
b (Intercept as % of full scale)=	-0.33%	-0.35%	0.00%
% change in C.F. from last cal=	n/a	n/a	n/a
NO ₂ converter efficiency	n/a	n/a	1.00

LIMITS
> or = 0.995
0.95-1.05
± 3% F.S.
n/a
0.96 to 1.04

As found:		As left:	
NOx SLOPE:	n/a	NOx SLOPE:	1.133
NOx OFFS:	n/a	NOx OFFS:	0.4
NO SLOPE:	n/a	NO SLOPE:	1.134
NO OFFS:	n/a	NO OFFS:	-0.7
SAMP FLW:	n/a	SAMP FLW:	448
OZONE FL:	n/a	OZONE FL:	81
NORM PMT:	n/a	NORM PMT:	0.4
AZERO:	n/a	AZERO:	19.7
HVPS:	n/a	HVPS:	731
DCPS:	n/a	DCPS:	2559
RCCELL:	n/a	RCCELL:	50.7
BOX TEMP:	n/a	BOX TEMP:	28.5
IZS TEMP:	n/a	IZS TEMP:	46.0
MOLY TEMP:	n/a	MOLY TEMP:	316.4
RCCEL:	n/a	RCCEL:	6.7
SAMP:	n/a	SAMP:	26.9
Expected Value NO:	n/a	Expected Value NO:	11
Expected Value NO ₂ :	n/a	Expected Value NO ₂ :	433
Expected Value NOx:	n/a	Expected Value NOx:	443

Comments:

The analyzer sample inlet filter was changed.

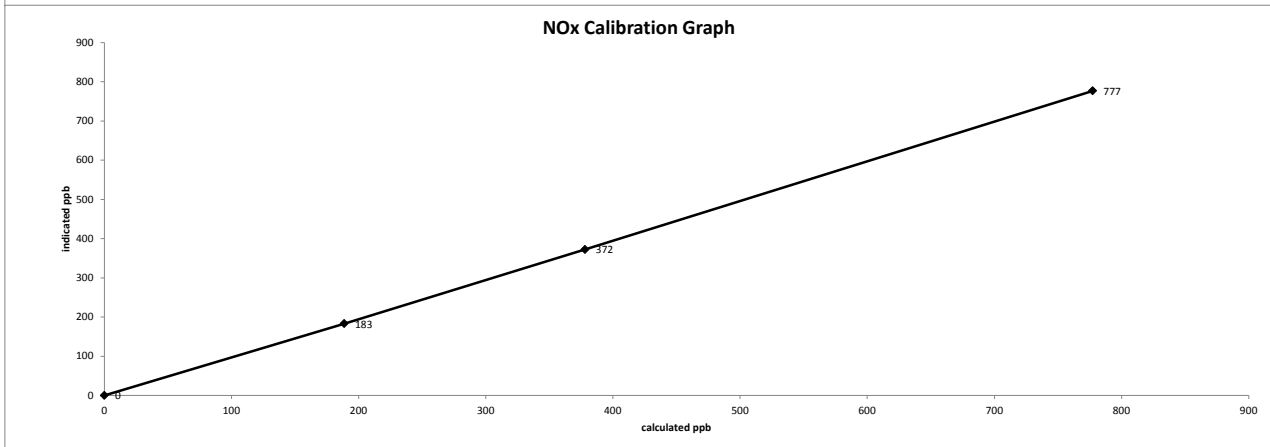
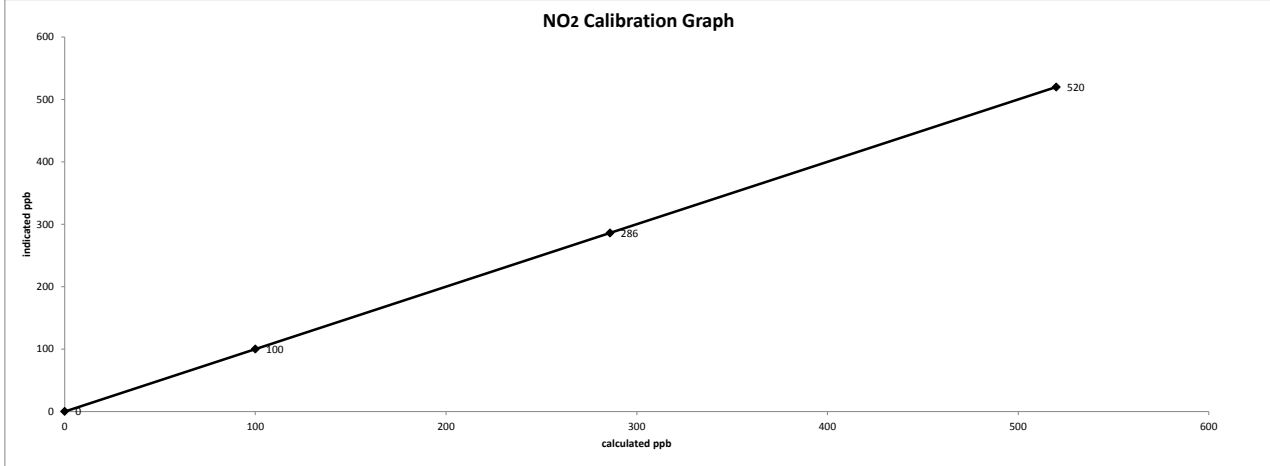
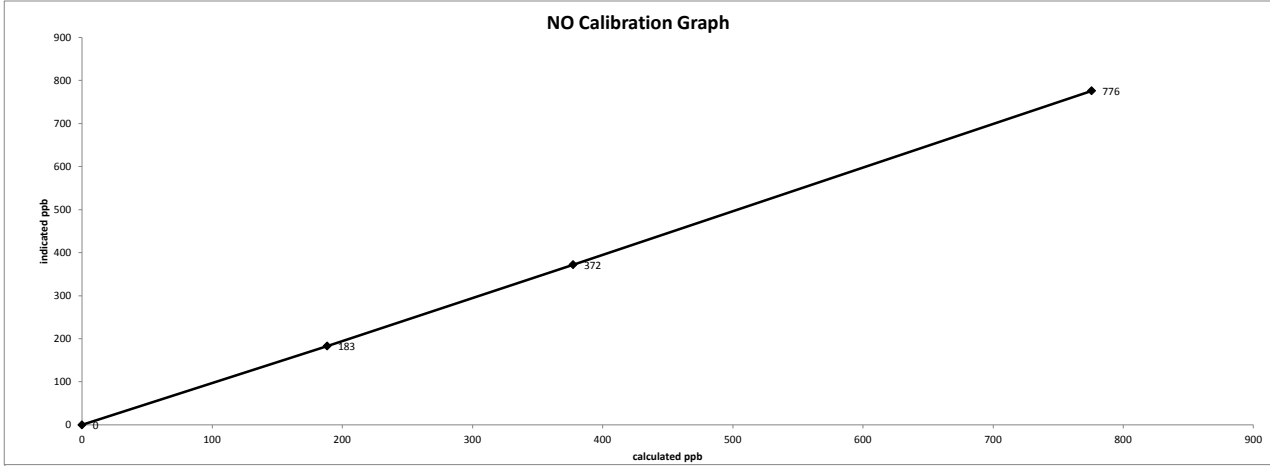
The manifold blower was found to be working normally.

The analyzer cooling fan filter(s) were cleaned.

Date: March 1, 2018
Company/Airshed: LICA
Location/Station Name: St. Lina

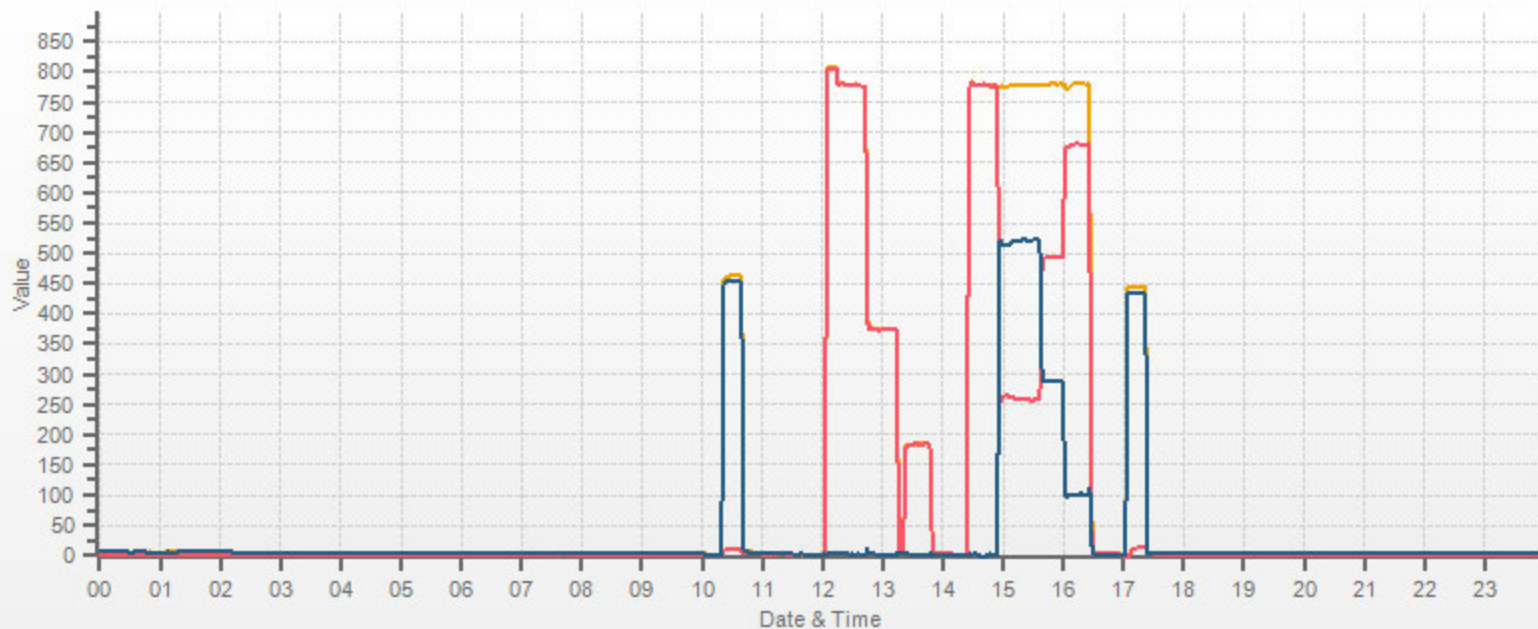
Start/End Time 24 hr. (mst): 10:50 / 17:27
Calibration Purpose: installation
Calibration Method: Gas Dilution & Gas Phase Titration

API 200A NO-NO2-NOx Analyzer Calibration



Station: LICA ST. LINA Daily: 18/03/01 Type: AVG 1 Min. [1 Min.]

— NOX[ppb] — NO[ppb] — NO2[ppb]



OZONE



Thermo 49i Ozone Analyzer Calibration

Date: <u>March 1, 2018</u> Company/Airshed: <u>LICA</u> Location/Station Name: <u>St. Lina</u> Start/End Time 24 hr. (mst): <u>11:21 / 15:36</u> Ozone Calibration Method: <u>Varying UV Lamp Power</u> G.P.T. Date: <u>n/a-done by Varying UV Lamp Power</u>	Barometer/B.P./units: <u>F.S. 05544 expires January 5, 2019</u> <u>932</u> <u>millibars</u> Thermometer/Station Temp: <u>F.S. 170286131 expires April 19, 2019</u> <u>22</u> <u>°C</u> Weather Conditions: <u>Mix of sun and clouds</u> Calibration Purpose: <u>routine monthly</u> Performed By/Reviewer: <u>Alex Yakupov</u> <u>Rob Fisher</u> Cal Gas Expiry Date: <u>n/a-done by Varying UV Lamp Power</u>
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Analyzer: ID# or Serial Number: <u>1002240371</u> Last Calibration Date: <u>February 13, 2018</u> Previous Cal High Point C.F.: <u>1.000</u>	Ozone Range ppb: <u>500</u> As Found C.F.: <u>1.003</u> New C.F.: <u>1.000</u>
---	---

Calibration Standards:									
Low Flow Meter ID/Expiry Date: <u>Defender Low 152019 expires December 13, 2018</u> High Flow Meter ID/Expiry Date: <u>Defender High 148944 expires December 13, 2018</u> Calibrator ID/Expiry Date: <u>Sabio id# 11900613 expires March 16, 2018</u> Cal Gas Cylinder I.D. #: <u>n/a</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Point</th> <th>AMD Required Range of Ozone Calibration Points</th> </tr> <tr> <td>High</td> <td>300-400 ppb</td> </tr> <tr> <td>Mid</td> <td>150-200 ppb</td> </tr> <tr> <td>Low</td> <td>50-75 ppb</td> </tr> </table>	Point	AMD Required Range of Ozone Calibration Points	High	300-400 ppb	Mid	150-200 ppb	Low	50-75 ppb
Point	AMD Required Range of Ozone Calibration Points								
High	300-400 ppb								
Mid	150-200 ppb								
Low	50-75 ppb								

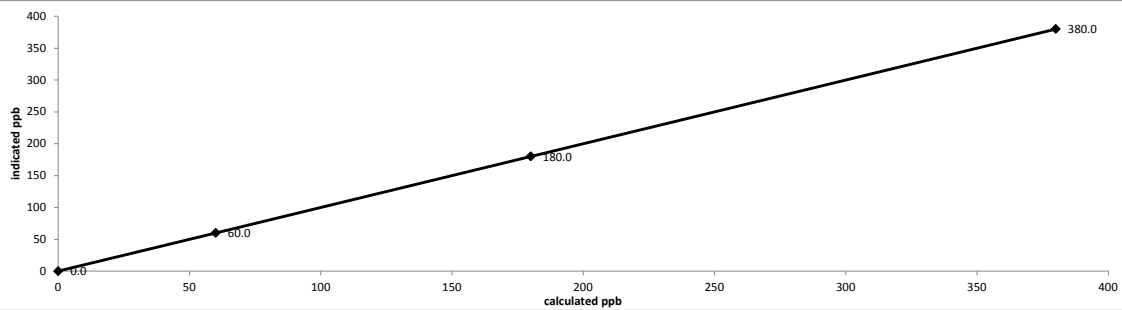
ALL POINTS ARE 15 MINUTES OF STABILITY AS OF SEPTEMBER 23, 2015

Point	Calibrator Flow Rate (cc/min)		Calculated Concentration:	Corrected Calculated Concentration:	Indicated Concentration:	Correction Factors:
	Total Flow @ Point Start	Total Flow @ Point Finish	(ppb)	(ppb)	(ppb)	
as found zero	5000	5000	0.0	n/a	0.0	n/a
as found high	5000	5000	380.0	380.0	379.0	1.003
adjusted zero	5000	5000	0.0	0.0	0.0	n/a
adjusted high	5000	5000	380.0	380.0	380.0	1.000
mid	5000	5000	180.0	180.0	180.0	1.000
low	5000	5000	60.0	60.0	60.0	1.000
calibrator zero	5000	5000	0.0	n/a	0.0	n/a
Average C.F. =						1.000

Linear Regression/Calibration Results:

Correlation Coefficient = <u>1.000</u> Slope = <u>1.000</u> b (Intercept as % of full scale) = <u>0.00%</u> % change in C.F. from last cal = <u>-0.26%</u>	LIMITS > or = 0.995 0.95-1.05 ± 3% F.S. ± 10%
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Thermo 49i Ozone Analyzer Calibration

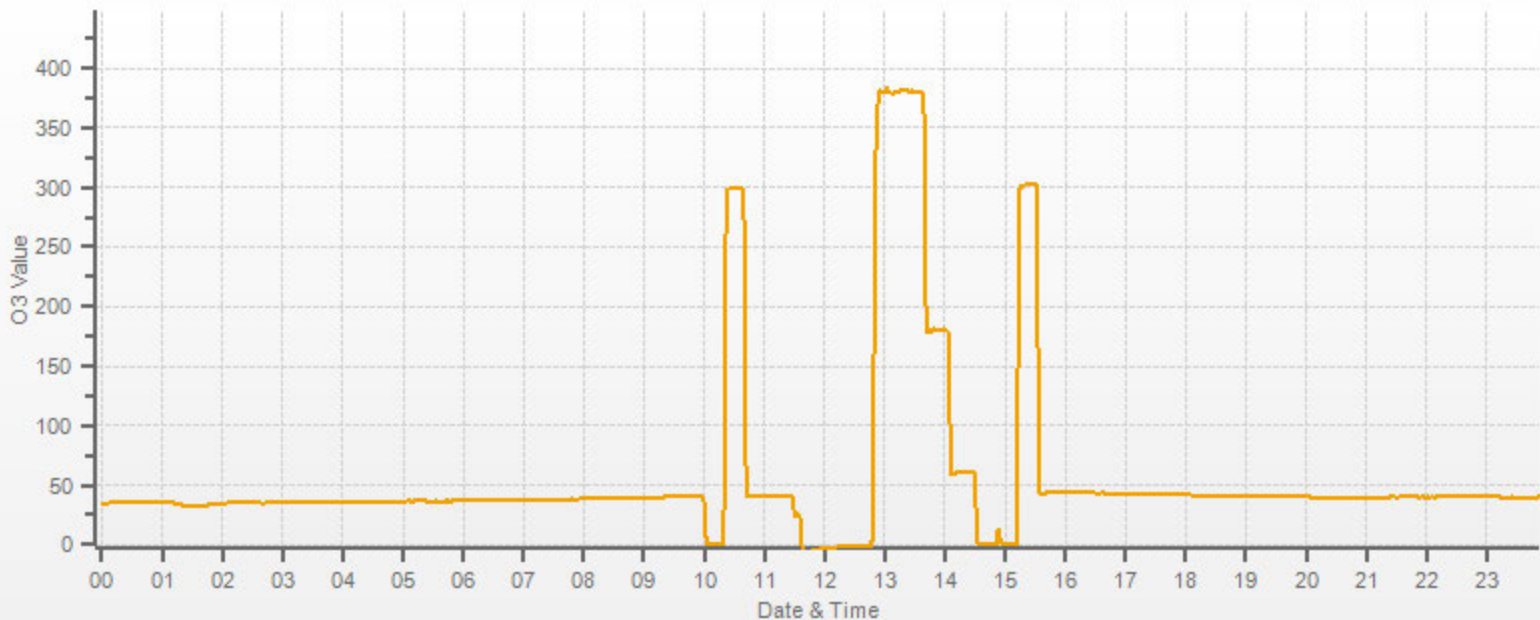


As found: O3 Bkg: <u>-0.1</u> O3 Coef: <u>0.961</u> Photo Lamp: <u>10.7</u> O3 Lamp: <u>8.2</u> Bench: <u>28.0</u> Bench Lamp: <u>53.6</u> O3 Lamp: <u>67.7</u> Pressure: <u>684.1</u> Cell A lpm: <u>0.733</u> Cell B lpm: <u>0.772</u> O3 ppb: <u>24.2</u> Cell A ppb: <u>24.0</u> Cell B ppb: <u>24.5</u> Cell A int: <u>78851</u> Cell B int: <u>98668.0</u> Expected Value: <u>303.0</u>	As left: O3 Bkg: <u>-0.1</u> O3 Coef: <u>0.965</u> Photo Lamp: <u>10.7</u> O3 Lamp: <u>8.2</u> Bench: <u>28.2</u> Bench Lamp: <u>53.6</u> O3 Lamp: <u>67.7</u> Pressure: <u>685.0</u> Cell A lpm: <u>0.735</u> Cell B lpm: <u>0.775</u> O3 ppb: <u>-0.7</u> Cell A ppb: <u>-2.4</u> Cell B ppb: <u>1.1</u> Cell A int: <u>77820</u> Cell B int: <u>98680.0</u> Expected Value: <u>302.0</u>
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Comments:

The analyzer sample inlet filter was changed.
The analyzer cooling fan filter(s) were cleaned.
The manifold blower was found to be working normally.

O3[ppb]



PARTICULATE MATTER 2.5



"I" Series Sharp 5030 Monitor Monthly Audit

Date:	March 6, 2018	Performed By/Reviewer:	Alex Yakupov	Rob Fisher
Company:	LICA	Start Time (mst):	13:36	
Station Name/Location:	St. Lina	End Time (mst):	14:30	
Previous Audit Date:	February 26, 2018	Calibration Purpose:	routine monthly	
Parameter:	PM 2.5	Weather Conditions:	Mainly sunny	

SHARP Information and Status:				
Serial Number:	CM1709001	Status:	SAMPLE	
Approx. % Tape remaining:	2/5	Error Code:	None	

Reference Standards/I.D./Expiry Date:				
High Flow:	Airmetrics/Chinook High Maxxam ID #1; expires February 14, 2019			
Digital Manometer:	Dwyer 475 Mark III id# 1 expires April 24, 2018			
Temperature:	F.S. 170286131 expires April 19, 2019			
Pressure:	F.S. 05544 expires January 05, 2019			
RH:	F.S. 170286131 expires April 19, 2019			

As found temperature and pressure:				
Tolerance °C +/-	3	Tolerance mmHg +/-	12	
SHARP T1 (°C):	-3.6	SHARP P3 (mmHg):	704.00	
Reference (°C):	-3.1	Reference (mmHg):	705.00	
Difference (°C):	0.5	Difference (mmHg):	1.0	

As left temperature and pressure (same as above if as found adequate):				
Tolerance °C +/-	3	Tolerance mmHg +/-	12	
SHARP T1 (°C):	-4.7	SHARP P3 (mmHg):	704.00	
Reference (°C):	-4.2	Reference (mmHg):	705.00	
Difference (°C):	0.5	Difference (mmHg):	1.0	

As found flows:				
SHARP Airflow l/hr	1000.00	Tolerance lpm +/-	5%	
Pump Voltage (%)	n/a	SHARP Airflow (lpm)	16.67	
		Reference Airflow (lpm)	17.29	
		Difference (%)	3.61%	

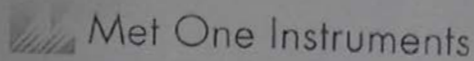
As left flows (same as above if as found adequate):				
Targets: 1000 l/hr / <90%				
SHARP Airflow l/hr	1000.00	Tolerance lpm +/-	5%	
Pump Voltage (%)	n/a	SHARP Airflow (lpm)	16.67	
		Reference Airflow (lpm)	16.66	
		Difference (l/min)	-0.04%	

As found relative humidity:			As left relative humidity (same as "as found" if adequate):	
Tolerance % +/-	5	Sharp RH (%)	5	
Sharp RH (%)	48.4	Sharp RH (%)	47.50	
Reference RH (%)	43.6	Reference RH (%)	47.50	
Difference:	-4.8	Difference:	0.0	

Inlet Assembly:		
Inlet Head/Sharp Cut	Yes/No?	If no, give reason:
Cleaned:	yes	

Comments:

WIND SYSTEM



Sonic Wind Sensor Certificate of Calibration

Sensor Model No.: 50.5H
 Sensor Output Swing: 0V - 1.0V
 Customer: MAXXAM Analytics
 Tested per PO: 35-67600
 Calibrated by: David Frith *DF*

Sensor Serial No.: H12635
 Sensor Output Range: 0 - 50.0 MPS
 Sales Order No.: 122618
 Calibration Date: 05/25/2017

QC Inspection *Chris Paul*

Instrument Condition Within Tolerance: As Found As Left
 Corrective Action: No Adjustment Adjust Repair
 Preventative Maintenance

As Found Test Date: N/A As Left Test Date: 05/25/2017

Quality Control Manual Revision: September 16, 2013 MP42201 Rev. G.
 All Work Performed per Customer Purchase Order Requirements.
 Calibration Document No. 50.5-6100

Test Equipment Used for Calibration of Instruments

Description	Manufacturer	Model No.	Serial No.	Cal Date	Cal Due	Voltage Accuracy	Time Base Accuracy
Data Acquisition	Campbell Scientific	CR1000	6569	4/06/2015	4/06/2018	+/- 3mV	< 6 ppm
NIST Cupset	Met One Instruments	170-41	3309	1/26/2017	1/26/2022	Accuracy < 0.15 mph or 1% WS	

Environmental Data: Temperature 65 to 80 Deg F Vibration none
 Humidity 20 to 70% Radiation none

Firmware Version: 3194-01 R2.62

The standards used for calibration have accuracies equal to or greater than the instruments tested. These standards are on record and are traceable to NIST to the extent allowed by the institute's calibration facility. Unless otherwise stated heron, all instruments are calibrated to meet the manufacturer's published specifications. The calibration system complies with MIL-STD-45662A (8/1/88). Instrument's accuracy meets the requirements of Regulatory Guide 1.23 (2/72). Compliant with IS) 9001:2008 requirements

CALIBRATORS

Company Maxxam Operator: Mike

Calibrator:		Flow Measurement Device:	
Make/Model	<u>API 700</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>690</u>	Serial Number	<u>HI148944 Lo 152019</u>
Last Verification Date	<u>March 30, 2016\</u>	Temperature (°C)	<u>23.3</u>
NO Cylinder S/N	<u>EY0000597</u>	Barometric Pressure	<u>704.3mmHg</u>
NO [PPM]	<u>49.0 NOx [PPM]</u>		<u>49.0</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)			
Pt. #1	<u>4898</u>	Pt. #2	<u>4942</u>
		Pt. #3	<u>4953</u>
Gas Flow (sccm)			
Pt. #1	<u>79.2</u>	Pt. #2	<u>38.6</u>
		Pt. #3	<u>19.3</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4977	0.0	0.0000	0.0000	0.0000	0.0000	0.0000	Limit ± 10%	
4977	79.2	0.7792	0.7792	0.7841	0.0012	0.7854	1%	1%
4981	38.6	0.3797	0.3797	0.3813	0.0006	0.3819	0%	1%
492	19.3	0.1902	0.1902	0.1927	0.0002	0.1929	1%	1%
Absolute Average Percent Difference							1%	1%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO		LIMITS		NOx	
Correlation=	1.0000	≥ 0.990		Correlation=	1.0000
m (Slope)=	1.0056	0.90-1.10		m (Slope)=	1.0073
b (Intercept % of FS)=	0.0357	± 3% F.S.		b (Intercept % of FS)=	0.0304

Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4977	0.000	0.0000	0.7928	0.0014	0.7941	NO ₂	% Diff. Limit
4977	0.500	0.5448	0.2480	0.5391	0.7871	-1%	± 10%
4977	0.250	0.2862	0.5066	0.2861	0.7926	-1%	± 10%
4977	0.100	0.1221	0.6707	0.1193	0.7914	-3%	± 10%
Absolute Average Percent Difference						2%	± 10%

LINEAR REGRESSION ANALYSIS *y=mx+b (where x=calculated concentration, y=indicated concentration)*

NO ₂		LIMITS	
Correlation=	1.0000	≥ 0.995	
m (Slope)=	0.9894	0.90-1.10	
b (Intercept % of FS)=	0.0719	± 3% F.S.	

AENV Standards Audit Calibrator		NO _x Analyzer	
Make/Model	<u>Thermo 146i</u>	Make/Model	<u>Thermo 42i</u>
Serial/AMU Number	<u>1809</u>	Serial/AMU Number	<u>1868</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Last Calibration Date	<u>March 15, 2017</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Full Scale (ppm)	<u>1.0</u>
		Cylinder Gas Expiry Date	<u>March 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature: [Signature]

Date: March 17, 2017
Location: McIntyre Center Edmonton

Company <u>Maxxam</u>		Operator: <u>Mike</u>	
Calibrator:		Flow Measurement Device:	
Make/Model	<u>Sabio 2010D</u>	Make/Model	<u>Bios Defender 530</u>
Serial Number	<u>11900613</u>	Serial Number	<u>HI148944 Lo 152019</u>
Last Verification Date	<u>March 31, 2016</u>	Temperature (°C)	<u>23.9</u>
NO Cylinder S/N	<u>EY0000769</u>	Barometric Pressure	<u>698mmHg</u>
NO [PPM]	<u>51.1</u>	NOx [PPM]	<u>51.2</u>
Expiry Date	<u>December 8, 2019</u>		

Dilution Flow (sccm)		
Pt. #1 <u>4879</u>	Pt. #2 <u>4932</u>	Pt. #3 <u>4950</u>
Gas Flow (sccm)		
Pt. #1 <u>74.5</u>	Pt. #2 <u>36.4</u>	Pt. #3 <u>18.2</u>

Calibrator Flow (sccm)		Calculated Conc.(ppm)		Indicated Conc.(ppm)			% Difference vs Audit Gas	
Dilution	Gas	NO	NOx	NO	NO ₂	NOx	NO	NOx
4965	0.0	0.0000	0.0000	0.0001	0.0000	0.0001	Limit ± 10%	
4954	74.5	0.7685	0.7700	0.7915	0.0008	0.7923	3%	3%
4968	36.4	0.3744	0.3751	0.3832	0.0006	0.3838	2%	2%
4968	18.2	0.1872	0.1876	0.1916	0.0002	0.1918	2%	2%
Absolute Average Percent Difference							3%	2%

LINEAR REGRESSION ANALYSIS $y=mx+b$ (where x=calculated concentration, y=indicated concentration)

NO	LIMITS	NOx
Correlation= 1.0000	≥ 0.990	Correlation= 1.0000
m (Slope)= 1.0301	0.90-1.10	m (Slope)= 1.0291
b (Intercept % of FS)= -0.0919	± 3% F.S.	b (Intercept % of FS)= -0.0881

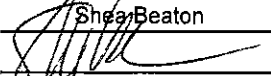
Flow	O ₃ Conc	NO Decrease	NO	NO ₂	NOX	% Diff. Vs Audit gas	
4954	0.000	0.0000	0.7949	0.0005	0.7954	NO ₂	% Diff. Limit
4954	0.510	0.5104	0.2845	0.5072	0.7917	-1%	± 10%
4954	0.250	0.2516	0.5433	0.2514	0.7944	0%	± 10%
4954	0.100	0.1085	0.6864	0.1087	0.7951	0%	± 10%
Absolute Average Percent Difference						0%	± 10%

LINEAR REGRESSION ANALYSIS $y=mx+b$ (where x=calculated concentration, y=indicated concentration)

NO ₂	LIMITS
Correlation= 1.0000	≥ 0.995
m (Slope)= 0.9926	0.90-1.10
b (Intercept % of FS)= 0.0925	± 3% F.S.

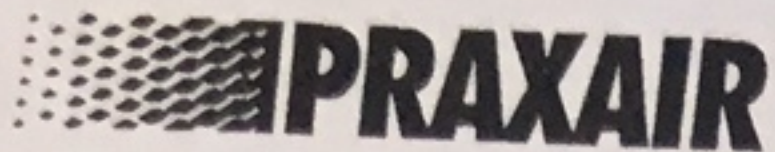
AENV Standards		NO_x Analyzer	
Audit Calibrator		Make/Model	<u>Thermo 42i</u>
Make/Model	<u>Thermo 146i</u>	Serial/AMU Number	<u>1868</u>
Serial/AMU Number	<u>1809</u>	Last Calibration Date	<u>March 15, 2017</u>
SRM Gas Cylinder No.	<u>CAL018140</u>	Full Scale (ppm)	<u>1.0</u>
Cylinder Conc. (ppm)	<u>48.79</u>	Cylinder Gas Expiry Date	<u>March 28, 2019</u>

COMMENTS: Gas has ~50ppm SO2

Auditor: Shea Beaton
Operator Signature: 

Date: March 16, 2017
Location: McIntyre Center Edmonton

CALIBRATION GASES



Praxair
 5700 South Alameda Street
 Los Angeles, CA 90058
 Tel: (323) 585-2154 Fax: (714) 542-6689
 PGVPID: F22017

DocNumber: 000116115

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

PRAXAIR PKG EDMONTON PLT 8
 9501 34TH ST
 EDMONTON AB T6B 2X

Praxair Order Number: 45314542
 Customer P. O. Number: 582-277
 Customer Reference Number:

Fill Date: 10/12/2017
 Part Number: NI NO50MS2E-AQ
 Lot Number: 70086728507
 Cylinder Style & Outlet: AQ CGA 660
 Cylinder Pressure & Volume: 2000 psig 82 cu. ft.

Certified Concentration:

Expiration Date:	10/24/2020	NIST Traceable
Cylinder Number:	LL104225	Analytical Uncertainty:
51.5 ppm	NITRIC OXIDE	± 0.7 %
49.2 ppm	SULFUR DIOXIDE	± 1 %
Balance	NITROGEN	

NOx = 51.6 ppm

NOx for Reference Only

Certification Information: Certification Date: 10/24/2017 Term: 36 Months Expiration Date: 10/24/2020

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: NITRIC OXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 51.5 ppm
 Instrument Used: Thermo Electron 42i-LS S/N 1030645077
 Analytical Method: Chemiluminescence
 Last Multipoint Calibration: 10/14/2017

Reference Standard Type: GMIS
 Ref. Std. Cylinder #: CC363145
 Ref. Std. Conc: 50.79 ppm
 Ref. Std. Traceable to SRM #: vs. 1683b
 SRM Sample #: 45.-V-42
 SRM Cylinder #: CAL017897

First Analysis Data:				Date: 10/17/2017			
Z:	0	R:	50.8	C:	51.5	Conc:	51.49
R:	50.8	Z:	0	C:	51.6	Conc:	51.59
Z:	0	C:	51.6	R:	50.8	Conc:	51.59
UOM:	ppm		Mean Test Assay:		51.557 ppm		

Second Analysis Data:				Date: 10/24/2017			
Z:	0	R:	50.8	C:	51.4	Conc:	51.39
R:	50.8	Z:	0	C:	51.5	Conc:	51.49
Z:	0	C:	51.4	R:	50.8	Conc:	51.39
UOM:	ppm		Mean Test Assay:		51.423 ppm		

2. Component: SULFUR DIOXIDE

Requested Concentration: 50 ppm
 Certified Concentration: 49.2 ppm
 Instrument Used: Ametek 921CE S/N AW-921-S321
 Analytical Method: Ultraviolet Absorption
 Last Multipoint Calibration: 10/13/2017

Reference Standard Type: NTRM
 Ref. Std. Cylinder #: CC72593
 Ref. Std. Conc: 48.58 ppm
 Ref. Std. Traceable to SRM #: n/a
 SRM Sample #: 12070103
 SRM Cylinder #: N/A

First Analysis Data:				Date: 10/17/2017			
Z:	0	R:	48.2	C:	48.8	Conc:	49.151
R:	48.2	Z:	0	C:	48.8	Conc:	49.151
Z:	0	C:	48.9	R:	48.3	Conc:	49.251
UOM:	ppm		Mean Test Assay:		49.184 ppm		

Second Analysis Data:				Date: 10/24/2017			
Z:	0	R:	48.2	C:	48.7	Conc:	49.084
R:	48.2	Z:	0	C:	48.8	Conc:	49.185
Z:	0	C:	48.8	R:	48.2	Conc:	49.185
UOM:	ppm		Mean Test Assay:		49.151 ppm		

Analyzed by:

Henry Koung

Certified by:

Amalia Real

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specific analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc., arising out of the use of the information contained herein exceed the fee established for providing such information.

DocNumber: 000095123

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information:

MAXXAM ANALYTICS INC *NA*
 9372 49TH ST
 EDMONTON AB T6B 2L7

Praxair Order Number: 26284032
 Customer PO Number: 35-63415
 Customer Reference Number:

Fill Date: 5/31/2016
 Part Number: NI HS10ME-AQ
 Lot Number: 109615204
 Cylinder Style and Outlet: AS CGA 330
 Cylinder Pressure and Volume: 2000 psig 140 cu. ft.

Certified Concentration:

Expiration Date:	06/14/2019	NIST Traceable
Cylinder Number:	EY0000654	Expanded Uncertainty:
10.2 ppm	HYDROGEN SULFIDE	± 2.2 %
Balance	NITROGEN	

Certification Information: Certification Date : 6/14/2016 Term : 36 Months Expiration Date : 06/14/2019

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
 Do Not Use this Standard if Pressure is less than 100 PSIG.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component:

HYDROGEN SULFIDE

Requested Concentration: 10 ppm
 Certified Concentration: 10.2 ppm
 Instrument Used: INTERSCAN RM-17 S/N 715726
 Analytical Method: ELECTROLYTIC CELL
 Last Multipoint Calibration: 05/20/2016

Reference Standard Type: GMS
 Ref. Std. Cylinder #: ND03635
 Ref. Std. Conc: 20.20 PPM
 Ref. Std. traceable to SRM #: 2730
 SRM Sample #: 66-E-106
 SRM Cylinder #: CAL015447

First Analysis Data:			Date: 05/31/2016
Z: 0	R: 41.8	C: 21.02	Conc: 10.2
R: 41.6	Z: 0	C: 21.1	Conc: 10.2
Z: 0	C: 21.1	R: 41.6	Conc: 10.2
UOM: mV	Mean Test Assay: 10.2 ppm		

Second Analysis Data:			Date: 06/14/2016
Z: 0	R: 45.15	C: 22.55	Conc: 10.1
R: 45.1	Z: 0	C: 22.6	Conc: 10.1
Z: 0	C: 22.6	R: 45.1	Conc: 10.1
UOM: mV	Mean Test Assay: 10.1 ppm		

Analyzed by:



Ying Yu

Certified by:



Pupongmontre Pete



Calibration Gas Audit

CH4 / C3H8 Cylinder Gas

File No. 2015-029CGA

Company: Maxxam **Operators name:** Limin Li
Cylinder #: LL165367 **Conc CH4 (PPM)** 590/207 **Tolerance (%)** 2 **Certified By:** Praxair

Reference Calibrator and Gas:
 Make/Model R&R MFC 201
 Serial Number AMU 1691
 Last Verification Date May 21, 2015
 Gas Type CH4 Conc. 999.2
 Cylinder Number D751932
 Gas Type C3H8 Conc. 246.5
 Cylinder Number XF0037998

Flow Measurement Device:
 Make/Model Bios DC2
 Serial Number AMU 1650
 Temp. °C 24.0 C
 B.P. 703 mmhg

Reference Analyzer:
 Make/Model Teco 55C Serial/AMU Number: 1643
 Instrument Settings Zero: N/A Span: N/A Range: 20
 Last Calibration: Date: May 21/15 C.F. 1.000 Done By: Al Clark

Calibrator Flows (sccm)		Indicated Conc. (ppm)		Gas Flow/ Dilution Flow	Concentration Factor	Cylinder Concentration	
Dilution	Gas	CH4	C3H8			CH4	C3H8
2600	0.0	0.00	0.00	0.02005	49.883	602	206
2569	51.5	12.06	11.37	0.02005	49.883	602	206
3549	22.3	3.77	3.57	0.00628	159.148	600	207
3523	10.4	1.77	1.70	0.00295	338.750	600	209
Average Cylinder Concentration:						600	207

<u>CH4</u>	<u>C3H8</u>
Previous Stated Concentration PPM: <u>590</u>	<u>207</u>
Percent variance from Stated: <u>1.8</u>	<u>0.2</u>

Cylinder gas tolerances based on CH4 only

Meets Manufacturer Tolerance. Use manufacturers stated concentration **COMMENTS:** _____
 < =5% Outside Manufacturer Tolerance. Use manufacturers concentration _____
 > 5% Outside Manufacturer Tolerance. **DO NOT USE** this cylinder _____

Auditor: Al Clark Date: May 21, 2015
 Operator Signature: _____ Location: McIntyre Center Edmonton

***APPENDIX III
AEP AUDIT RESULTS***

STATION AUDIT

File No. 2017-526/567A

Date: March 13, 2018

Performed by: Shea Beaton

Station

Name: St. Lina

Location: St. Lina

Facility/Zone: Lica

Operator: Maxxam

Temp: 24.5

Barometric Press: 702mmHg

Location

Latitude N 54°12'59"

Longitude W 111°30'9"

Elevation 690

Status of Site Documentation On-Site - Complete

Status of Network Documentation OK

Status of QAP Last Audited June 2017

Manifold Material Glass

Manifold Condition Good

Meteorological

	Observed	Audit Value
Wind Speed Direction	<u>4.1km/h @ 98deg</u>	<u>Too Calm to Assess</u>
Station Temperature	<u>23</u>	<u>21.4</u>
Relative Humidity	<u>47%</u>	<u>51%</u>
Ambient Temperature	<u>1.8</u>	<u>0.4</u>
BP	<u>929.7mbar</u>	<u>931.3mBar</u>
Precipitation	<u>10 tips @0.1mm/tip</u>	<u>1.0mm</u>

Remarks:

Stn temp 1.6 deg C high; ambient temp 1.4 Deg C high

SO₂ ANALYZER AUDIT

File No. 2017-562A

Date: March 13, 2018

Performed by: Shea Beaton

Station

Name: St. Lina

Location: St. Lina

Facility/Zone: Lica

Operator: Maxxam

Temp. 24.5

Barometric Press. 702mmHg

Monitor

Make/Model: TAPI 100E Serial No: 468

Inlet flow (sccm): 602 Full Scale Range ppm: 1.0

Last cal. Date: March 2, 2018 Old Correction Factor: 1.000

Zero/Bkg 144.5

Span Coef 0.972

Calibrator

Calibration Method: GAS DILUTION Make/Model: R&R MFC 201

Cylinder #: EX0012544 AMU #: 1698

CGA Date: 15-Nov-17 SO₂ Concentration PPM: 51.1

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
4047	0.0	4047	0.0000	0.0020		
4131	59.1	4190	0.7208	0.7240	0%	± 10%
4060	26.4	4086	0.3302	0.3320	0%	± 10%
4064	13.5	4077	0.1692	0.1700	-1%	± 10%
Absolute Average Percent Difference					0%	

Linear Regression Analysis:

$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 1.0024

b (Intercept as % of full scale)= 0.1247

LIMITS

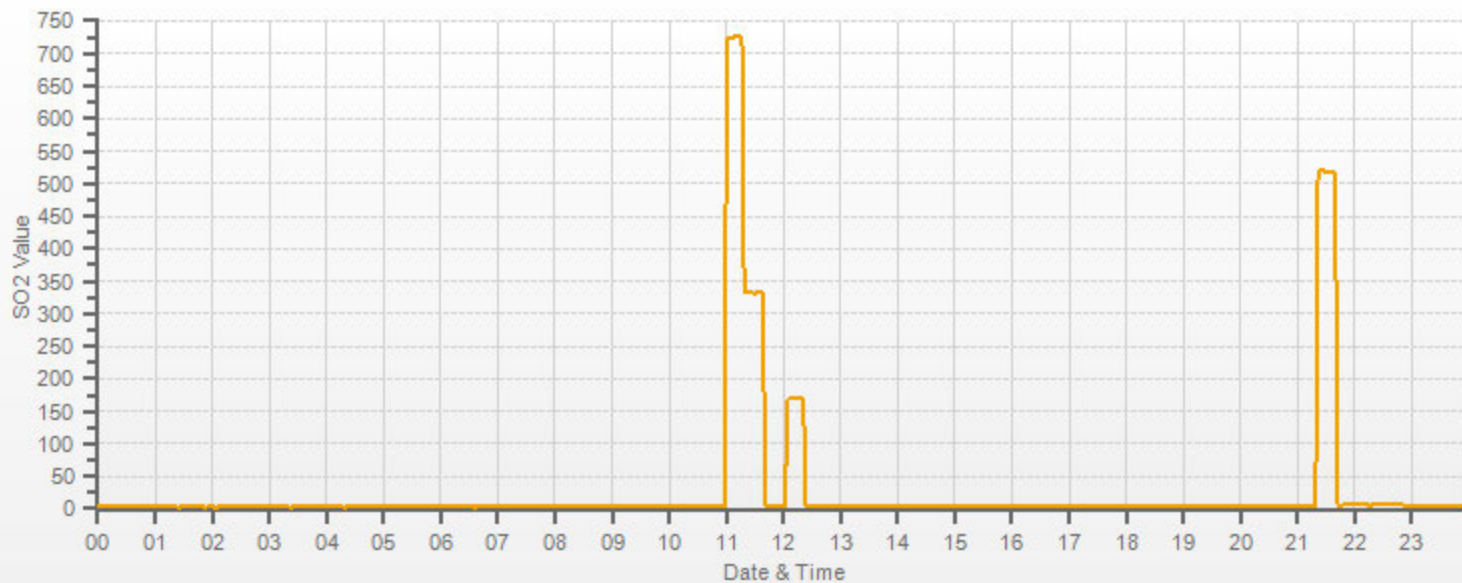
≥ **0.995**

0.90-1.10

± **3% F.S.**

Remarks:

— SO2[ppb]



H₂S ANALYZER AUDIT

File No. 2017-563A

Date: March 13, 2018

Performed by: Shea Beaton

Station

Name: St. Lina

Location: St. Lina

Facility/Zone: Lica

Operator: Maxxam

Temp. 24.5

Barometric Press. 702mmHg

Monitor

Make/Model: TAPI 101E Serial No: 509

Inlet flow (sccm): 522 Full Scale Range ppm: 0.1

Last cal. Date: March 5, 2018 Old Correction Factor: 1.000

Zero/Bkg 70.2

Span Coef 0.904

Calibrator

Calibration Method: GAS DILUTION Make/Model: R&R MFC 201

Cylinder #: EX0009231 AMU #: 1698

CGA Date: 9-Aug-17 H₂S Concentration PPM: 9.99

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
4047	0.0	4047	0.0000	0.0001		
4157	33.2	4190	0.0792	0.0826	4%	± 10%
4071	14.7	4086	0.0359	0.0370	3%	± 10%
4069	7.6	4077	0.0186	0.0194	4%	± 10%
Absolute Average Percent Difference					4%	

Linear Regression Analysis:

$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

Correlation Coeff.= 1.0000

m (Slope)= 1.0423

b (Intercept as % of full scale)= -0.0689

LIMITS

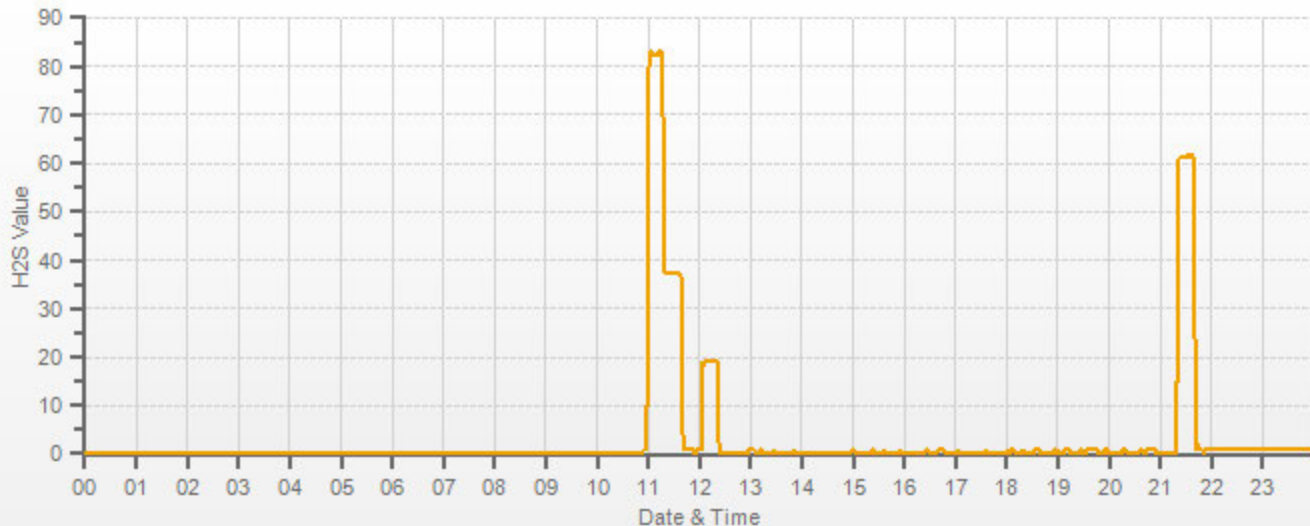
≥ **0.995**

0.90-1.10

± **3% F.S.**

Remarks:

H2S[ppb]



HC ANALYZER AUDIT

File No. 2017-566A

Date: March 13, 2018 Performed by: Shea Beaton

Station

Name: St. Lina Location: St. Lina
 Facility/Zone: Lica Operator: Maxxam
 Temp. 24.5 Barometric Press. 702mmHg

Monitor

Make/Model: Thermo 51iLT Serial No: 925436893
 Inlet flow (sccm): 9.7psi Full Scale Range ppm: 50.0
 Last cal. Date: March 6, 2018 Old Correction Factor: 0.998

Calibrator

Calibration Method: Gas Dilution
 Make/Model: R&R MFC 201 AMU #: 1698
 HC cylinder #: FF50323 HC concentration ppm: 1988.8

Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Concentration (ppm)	% Difference	
Air	Gas	Total			vs Audit Gas	Limits
3077	0.0	3077	0.00	0.0		
3071	58.3	3129	37.05	37.6	1%	± 10%
3069	26.3	3095	16.90	17.1	1%	± 10%
3074	13.5	3087	8.70	8.7	0%	± 10%
Absolute Average Percent Difference					1%	

Linear Regression Analysis:

$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

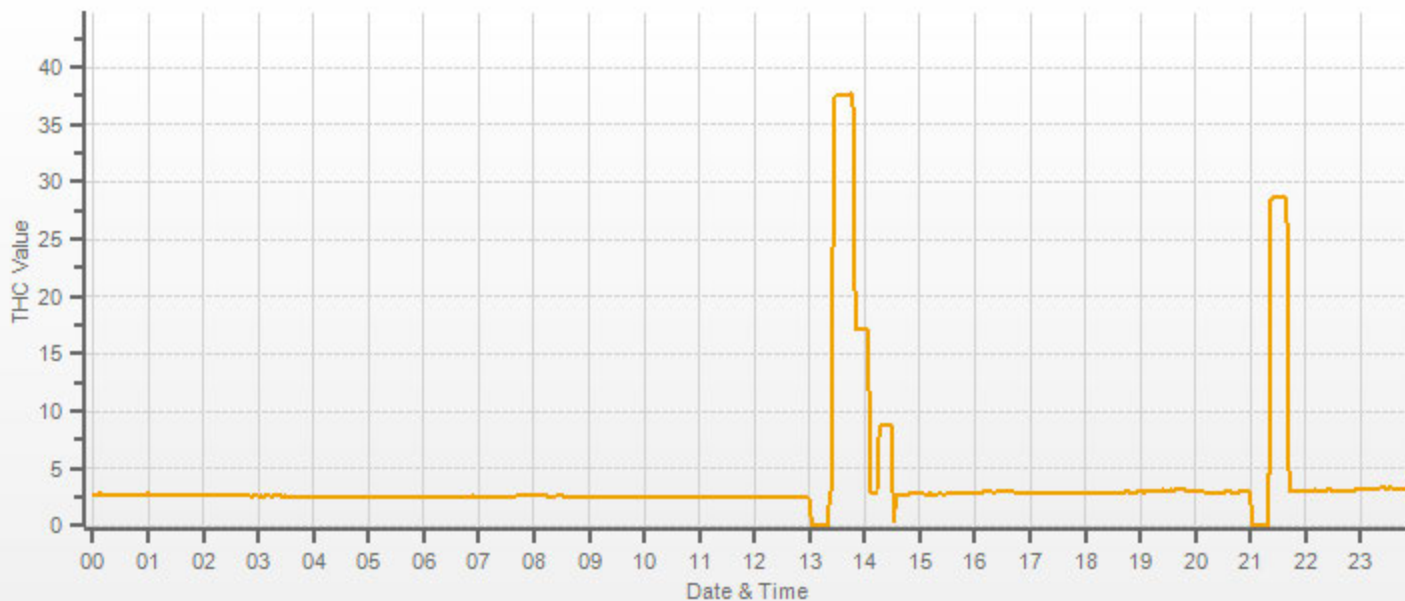
Correlation Coeff.= 1.0000
 m (Slope)= 1.0158
 b (Intercept as % of full scale)= -0.1205

LIMITS
≥ 0.995
0.90-1.10
± 3% F.S.

Remarks:



— THC[ppm]



NO-NOx-NO2 Analyzer Audit

File No. 2017-564A

Date: March 13, 2018 Performed by: Shea Beaton

Station:

Name: St. Lina Location: St. Lina Operator: Maxxam
Facility/Zone: Lica Temp.: 24.5 BP: 702

Monitor:

Make/Model: TAPI 200A Serial No. 1746
Inlet flow (scm): 445 Range ppm: 1.0
Last cal. Date: March 1, 2018 Old CF: NO: 1.000
NOx: 1.000
NO2: 1.000
NO Bkg -0.7
NOx Bkg 0.4
NO Coef 1.134
NOx Coef 1.133
NO2 Coef _____

Calibration Method: Gas Dilution / GPT

Calibrator: Make/Model: Sabio 2010 AMU# 1778
NO cylinder # EX0012160 NO conc. ppm 52.4 NOx conc. ppm 52.7
CGA Date 10-Aug-17

Calibrator Flows			Calc. Conc.		Indicated Concentration		% Difference vs Audit Gas	
Air	Gas	Total	NO (ppm)	NOx (ppm)	NO (ppm)	NOx (ppm)	NO	NOx
5002	0.0	5002	0.0000	0.0000	0.000	0.002	Limit ± 10%	
5003	63.5	5066	0.6568	0.6606	0.636	0.638	-3%	-4%
5041	33.7	5075	0.3480	0.3499	0.340	0.342	-2%	-3%
5051	14.5	5065	0.1500	0.1509	0.142	0.145	-5%	-5%
Absolute Average Percent Difference							4%	4%

Linear Regression Analysis:

y=mx+b (where x=calculated concentration, y=indicated concentration)

	NO	NOx	NO ₂	LIMITS
Correlation Coeff.=	<u>1.0000</u>	<u>1.0000</u>	<u>1.0000</u>	≥ 0.995
m (Slope)=	<u>0.9709</u>	<u>0.9648</u>	<u>0.9963</u>	0.90-1.10
b (Intercept as % of full scale)=	<u>-0.0804</u>	<u>0.1611</u>	<u>-0.0591</u>	± 3% F.S.

O ₃ Setting	Flow Rate	Indicated Conc. (ppm)			NO Decrease	NO ₂ Increase	% Difference vs Audit Gas	
		NO	NOx	NO ₂				
0.000	5066	0.633	0.635	0.002	0.633	0.635	0.002	%Dif Limit
0.745	5066	0.247	0.633	0.386	0.386	0.384	-1%	± 10%
0.411	5066	0.437	0.635	0.197	0.196	0.195	-1%	± 10%
0.240	5066	0.535	0.634	0.099	0.098	0.097	-1%	± 10%
Absolute Average Percent Difference							1%	

Converter Efficiency

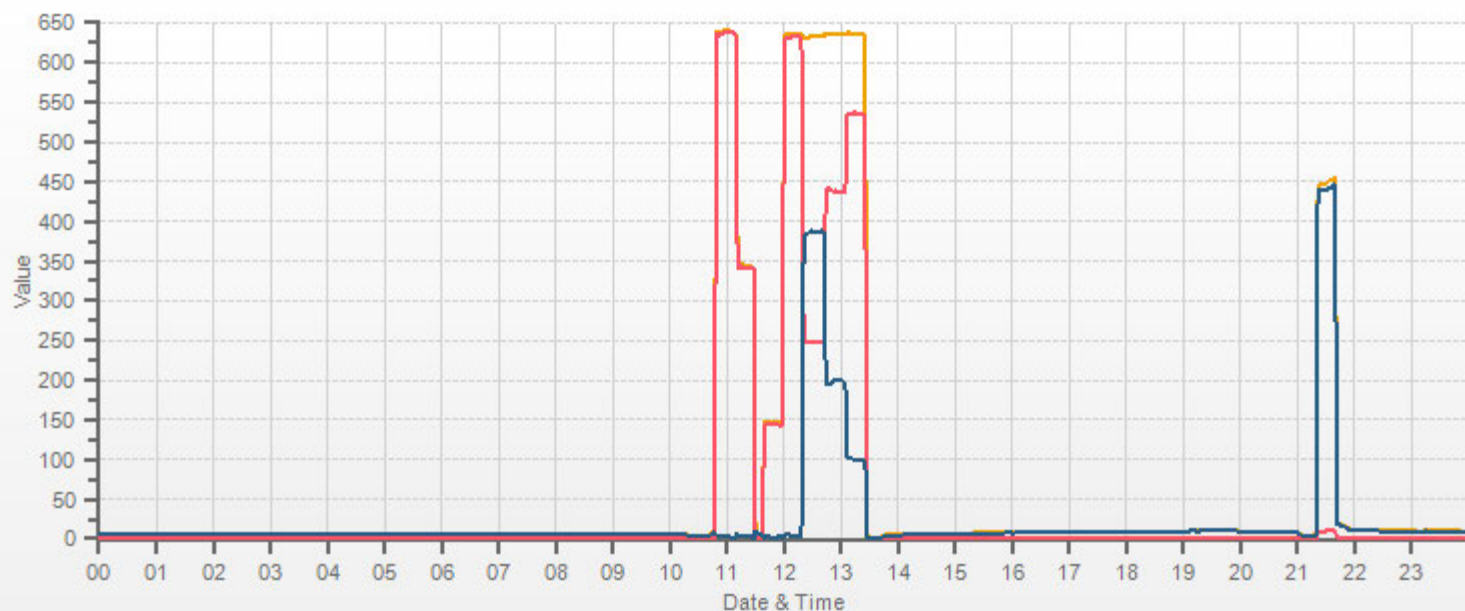
Average Converter Efficiency 99.3%

Remarks:



Station: LICA ST. LINA Daily: 18/03/13 Type: AVG 1 Min. [1 Min.]

NOX[ppb] NO[ppb] NO2[ppb]



O₃ ANALYZER AUDIT

File No. 2017-565A

Date: March 13, 2018

Performed by: Shea Beaton

Station

Name: St. Lina

Location: St. Lina

Facility/Zone: Lica

Operator: Maxxam

Temp. 24.5

Barometric Press. 702

Monitor

Make/Model: Thermo 49i Serial No: 1002240371

Inlet flow (sccm): 728/764 Full Scale Range ppm: 0.5

Last cal. Date: March 1, 2018 Old Correction Factor: 1.000

Zero/Bkg -0.1

Span Coeff. 0.965

Calibrator

Calibration Method: Photometer

Make/Model: Thermo 49iPS AMU #: 1808

NO cylinder #: NA NO concentration ppm: NA

Ozone Setting PPB/Current	Calibrator Flow (sccm)			Calculated Conc. (ppm)	Indicated Conc. (ppm)	% Difference	
	Air	Gas	Total			vs Audit Gas	Limits
0	3420	3420	3420	0.0000	0.0000		
400	3420	3420	3420	0.4000	0.3950	-1%	± 10%
200	3420	3420	3420	0.2000	0.1980	-1%	± 10%
100	3420	3420	3420	0.1000	0.0990	-1%	± 10%
Absolute Average Percent Difference						1%	

Linear Regression Analysis:

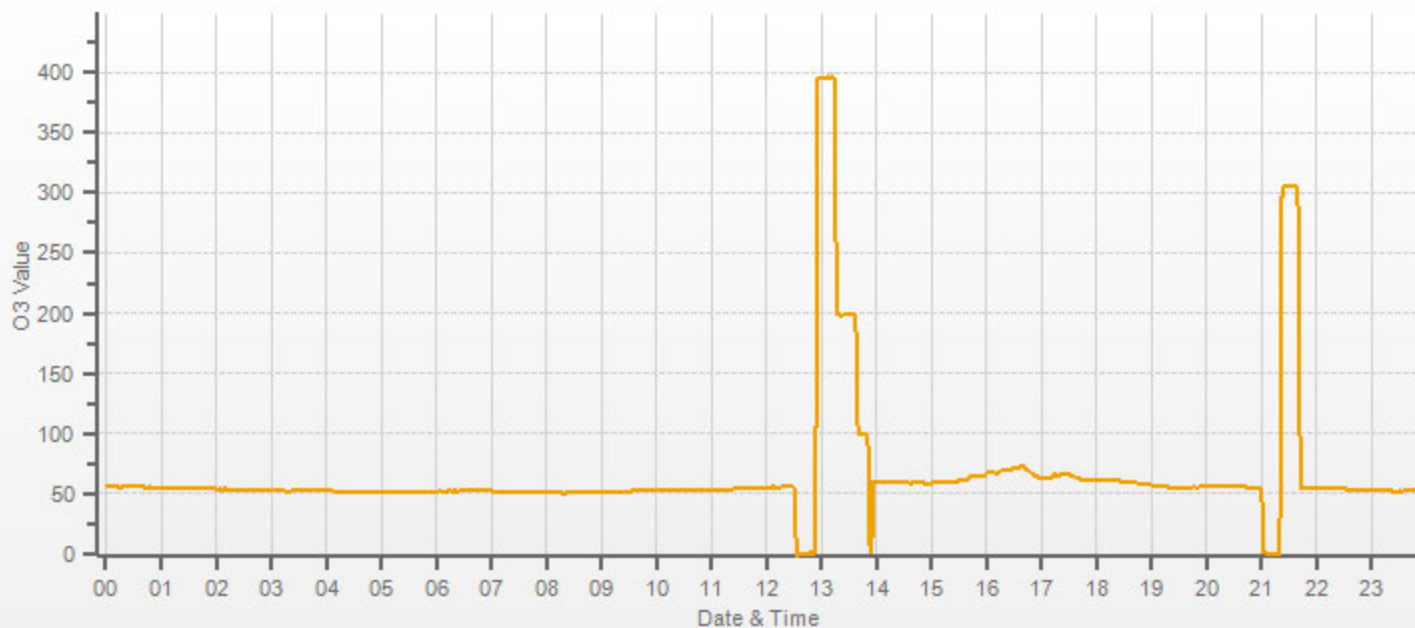
$y=mx+b$ (where x =calculated concentration, y =indicated concentration)

Correlation Coeff.= 1.0000
m (Slope)= 0.9874
b (Intercept as % of full scale)= 0.0400

LIMITS
≥ 0.995
0.90-1.10
± 3% F.S.

Remarks:

O3[ppb]



SHARP 5030 ANALYZER AUDIT

File No. 2017-567A

Date: March 13, 2018 Performed by: Shea Beaton

Station

Name: St. Lina Location: St. Lina
Facility/Zone: Lica Operator: Maxxam

Monitor

Make/Model: 5030i Serial No: CM17091001

Flow Audit Transfer Standard

Make/Model BGI Delta Cal Cell s/n 1858
Serial # _____

Met Audit Transfer Standard

Make/Model Vaisala HMP 76B Probe s/n AMU 1759
Serial # _____

Sample Flow

Set Pt.(LPH)	<u>1000</u>	Converted to LPM	<u>16.67</u>	Limit(+/-10%)	
Indicated	<u>999.6</u>		<u>16.66</u>		<u>0.0%</u>
Conv Meas Flow	<u>1000</u>		<u>16.67</u>	Measured	<u>16.7</u>

Leak Check

Starting value	<u>1000</u>	Lph	Flow	<u>16.67</u>	(LPM)
Leak Check	<u>996</u>	Lph	Flow	<u>16.60</u>	(LPM)
Adapter			Flow	<u>-0.4%</u>	(LPM+/- 2.5% or 0.42lpm)

Sensors

	Sharp	Audit	Difference	Tolerance
T1 - Amb Tmp°C	<u>0.1</u>	<u>1.1</u>	<u>1</u>	(+/- 4°C)
RH (%RH)	<u>48</u>	<u>47</u>	<u>-2%</u>	(+/- 2%)
Amb Press(hPa)	<u>697.7</u>	<u>699.5</u>	<u>1.8</u>	(+/-13.33hPa)

Background Zero

	Analog	Neph(µg/m³)	Limit	Conc
With Hepa	<u>NA</u>	<u>0.2</u>	<u>(<+/- 2 µg/m³)</u>	<u>NA</u>

Mass Foil Audit (Sensitivity)

	Old Factor	New Factor	Difference	Limit
Span Value	<u>7125</u>	<u>7010</u>	<u>-2%</u>	<u>(+/- 5%)</u>

- RH control set at 42%

Station Performance Audit Summary

Company: Lica Facility Name: NA
 Approval No.: NA Site Name: St. Lina
 Region: North Saskatchewan District: Cold Lake
 Parameters audited:

H ₂ S	X	SO ₂	X	NO _x	X	NH ₃		O ₃	X
CO		CH ₄		NonCH ₄		THC	X	TRS	
PM _{2.5}	X	PM ₁₀		TSP		BTEX		Wind Speed	X
Wind Dir	X	Amb. Temp	X	Stn.Temp	X	RH	X	BP	X
Rainfall		Precip	X	VWS		Other			
All parameters monitored as per approval: Yes _____ No _____ N/A_X_____									

GENERAL

	YES	NO	N/A
Has the location remained unchanged from previous audit?	X		
Is site secure?	X		
Are station operating conditions adequate?	X		

DATA ACQUISITION

Are strip charts in use?	X		
Is a telemetry system for data acquisition in use?	X		

SYSTEM COMPONENTS

Is a glass sampling manifold installed?	X		
Is sampling manifold clean?	X		
Is a manifold trap in place?	X		
Are spare manifold ports capped	X		
Is manifold oriented so it is not exactly horizontal?	X		
Are manifold ports situated to prevent water entering monitors?	X		
Is manifold pump properly installed and operative?	X		
Do sample lines extend at least 3/4" into manifold?	X		
Are monitor sampling lines connected to manifold?	X		
Are sampling lines clean?	X		
Are monitors properly mounted and secure?	X		
Are monitors properly exhausted from room or scrubbed?	X		
Are zero and span systems operational?	X		

WIND EQUIPMENT

Is wind sensor properly oriented?	X		
Does wind equipment appear to be functioning properly?	X		
Date of last calibration.	Date:	<u>May 25, 2017</u>	

COMMENTS: - Wind Head 11.0m; OK

AUDITOR: Shea Beaton DATE: March 13, 2018



Station Site Documents Audit Checklist

Station	Name: <u>St. Lina</u>	Location: <u>St. Lina</u>
	Facility/Zone: <u>Lica</u>	Operator: <u>Maxxam</u>

Required Elements of AMD Chapter 3 SS 4-B

Do the Site Documents Contain the Following:

- (a) Name of Owner/ Approval Holder
- (b) Name of Operating Agency
- (c) Contact Information
- (d) Date the Site or Station was Established
- (e) Date the information was last updated
- (f) Location including Latitude and Longitude
- (g) Four Colour Photos Looking N, E, S, W From Manifold Inlet
- (h) Additional Photos/Sketches of AMD Standard Site Non-Conformance
- (i) List of Instruments Located at the Site
- (j) Site Description Including the following:
 - (i) Land Use By Sector
 - (ii) Site Elevation
 - (iii) Greatest Angle of Elevation & Direction to Nearby Buildings
 - (iv) Average Building height in the area
 - (v) Distance to Nearest Trees

Meets AMD		NA	Current	
YES	NO		YES	NO
X			X	
X			X	
X			X	
X			X	
X			X	
X			X	
X			X	
		X		
X				X
X			X	
X			X	
X			X	
X			X	

Required Elements of AMD Chapter 3 SS 4-D

Do the Station Site Documents Contain the Following:

- (a) Recent Area Map Covering Approximately 1Km²
- (b) Plan View Sketch
- (c) Cross-Sectional Sketch of Area Within 500 m Radius
- (d) Colour Photos Showing Sample Manifold/Inlet
- (e) Colour Photo of the Station
- (f) Additional Photos/Sketches of AMD Standard Station Non-Conformance

Meets AMD		NA	Current	
YES	NO		YES	NO
X			X	
X			X	
		X		
X			X	
X			X	
		X		

COMMENTS: Instrument list outdated

AUDITOR: Shea Beaton DATE: March 13, 2018



Audit Summary

Form No. F-AA-018

Version 1.2

Page 1 of 3

Facility / Zone	Lica
Total # of parameters that passed	17
Total # of parameters audited in the network	17
Date(s) of the audit	March 13 to 15 2018
Issue Date of Audit Summary	23-Mar-18

Station Name	St. Lina
Auditor	Shea Beaton
Audit Date	13-Mar-18

Critical	Pass	Fail
H ₂ S	X	
SO ₂	X	
TRS		
NO / NO ₂ / NO _x	X	
O ₃	X	
THC	X	
Sharp PM _{2.5}	X	
Wind Speed / Wind Direction	X	
Wind head Orientation	X	
Manifold Fan	X	
Partisol PM _{2.5}		
Zero/Span Systems Operational	X	

Inspection Items	OK	Need for Improvement
Sample pump venting/scrubbing	X	
Heating / Air Conditioning	X	
Manifold	X	
Sample Lines	X	
Sharp PM _{2.5}	X	
Partisol PM _{2.5}		
Safety	X	
Site Conditions	X	

Non-critical	OK	Opportunity for Improvement
RH	X	
Station Temperature		X +/- 1°C
Ambient Temperature		X +/- 1°C
Barometric Pressure	X	
Tipping bucket	X	
Station Condition	X	
Station Documentation	X	

Not monitored at this location

***APPENDIX IV
MAXIMUM INSTANTANEOUS DATA***



LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - March 2018

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.	
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.		
DAY 1	3	2	2	2	2	2	2	2	2	2	S	1	2	2	Q	Q	1	1	2	2	2	2	2	1	1	3	2	24	
2	1	1	1	1	2	1	1	1	1	S	1	C	C	C	C	C	C	C	2	2	2	2	2	2	1	2	1	24	
3	2	2	2	2	3	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	24	
4	3	3	3	3	3	3	2	S	3	3	3	3	4	4	4	3	3	3	3	3	3	3	4	4	4	2	4	3	24
5	3	3	4	3	4	4	S	4	4	4	3	3	4	4	3	3	3	3	3	3	3	3	3	3	3	4	3	24	
6	3	3	2	2	2	S	3	2	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	3	2	3	3	24	
7	3	3	3	3	S	4	4	3	4	3	4	4	4	4	5	5	7	8	5	4	4	4	4	4	3	8	4	24	
8	4	4	5	S	5	5	4	4	4	6	6	6	6	6	6	6	7	6	5	6	6	5	5	5	4	7	5	24	
9	5	5	S	5	5	5	5	5	5	6	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	6	5	24	
10	4	S	3	4	3	4	3	4	4	4	4	3	3	3	3	3	3	3	3	3	3	4	4	5	5	3	5	4	24
11	S	6	4	5	5	5	4	5	5	5	5	5	5	4	4	6	5	4	4	4	4	3	3	3	S	3	6	4	24
12	3	4	4	3	3	3	2	3	3	2	3	3	2	3	3	3	3	3	3	3	3	3	3	S	3	2	4	3	24
13	3	3	3	3	3	3	4	3	3	3	3	Q	Q	Q	4	4	4	4	5	4	4	5	S	7	5	3	7	4	24
14	5	5	5	5	5	5	4	4	4	5	4	4	4	4	4	4	4	4	4	4	S	4	4	4	4	4	5	4	24
15	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	S	4	4	4	4	4	5	5	24
16	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	4	4	4	S	4	4	4	4	4	4	5	4	24
17	4	4	4	4	4	4	5	4	4	4	4	4	4	4	4	3	4	4	S	4	4	4	4	4	4	3	5	4	24
18	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	4	3	24
19	3	3	3	3	3	3	3	3	3	3	4	3	4	4	4	3	S	4	4	4	4	4	4	4	4	3	4	4	24
20	4	4	4	4	5	5	5	5	5	5	5	5	5	5	S	S	4	5	5	5	6	6	6	5	5	4	6	5	24
21	5	5	5	5	5	5	5	5	5	4	4	4	4	S	4	4	4	4	4	4	3	3	3	3	3	3	5	4	24
22	3	5	3	3	3	3	3	3	3	3	3	3	S	3	4	3	3	4	4	4	4	4	4	4	3	5	3	24	
23	4	4	4	4	4	4	5	4	5	5	S	S	5	5	4	5	5	4	4	4	4	4	5	4	5	4	5	4	24
24	5	5	5	5	5	5	6	6	6	6	S	5	5	5	5	5	5	5	4	4	4	4	5	5	4	6	5	24	
25	5	5	4	5	5	5	5	5	5	S	4	4	5	4	5	5	4	4	4	5	5	5	4	5	4	5	5	24	
26	5	5	5	5	5	5	5	S	5	5	7	7	6	6	5	5	5	5	5	5	5	5	6	6	5	7	5	24	
27	6	6	7	7	5	5	5	S	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	7	5	24	
28	4	4	4	4	4	4	S	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	4	5	4	24	
29	4	4	3	3	4	S	3	3	3	3	3	3	3	P	3	3	3	3	3	3	3	3	3	3	3	4	3	23	
30	3	4	4	4	S	4	4	4	4	3	5	4	5	4	4	4	5	4	3	3	3	3	3	3	3	3	5	4	24
31	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	6	6	3	6	3	24
HOURLY MAX	6	6	7	7	5	5	5	6	6	6	7	7	6	6	6	6	7	8	5	6	6	6	7	6					
HOURLY AVG	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					

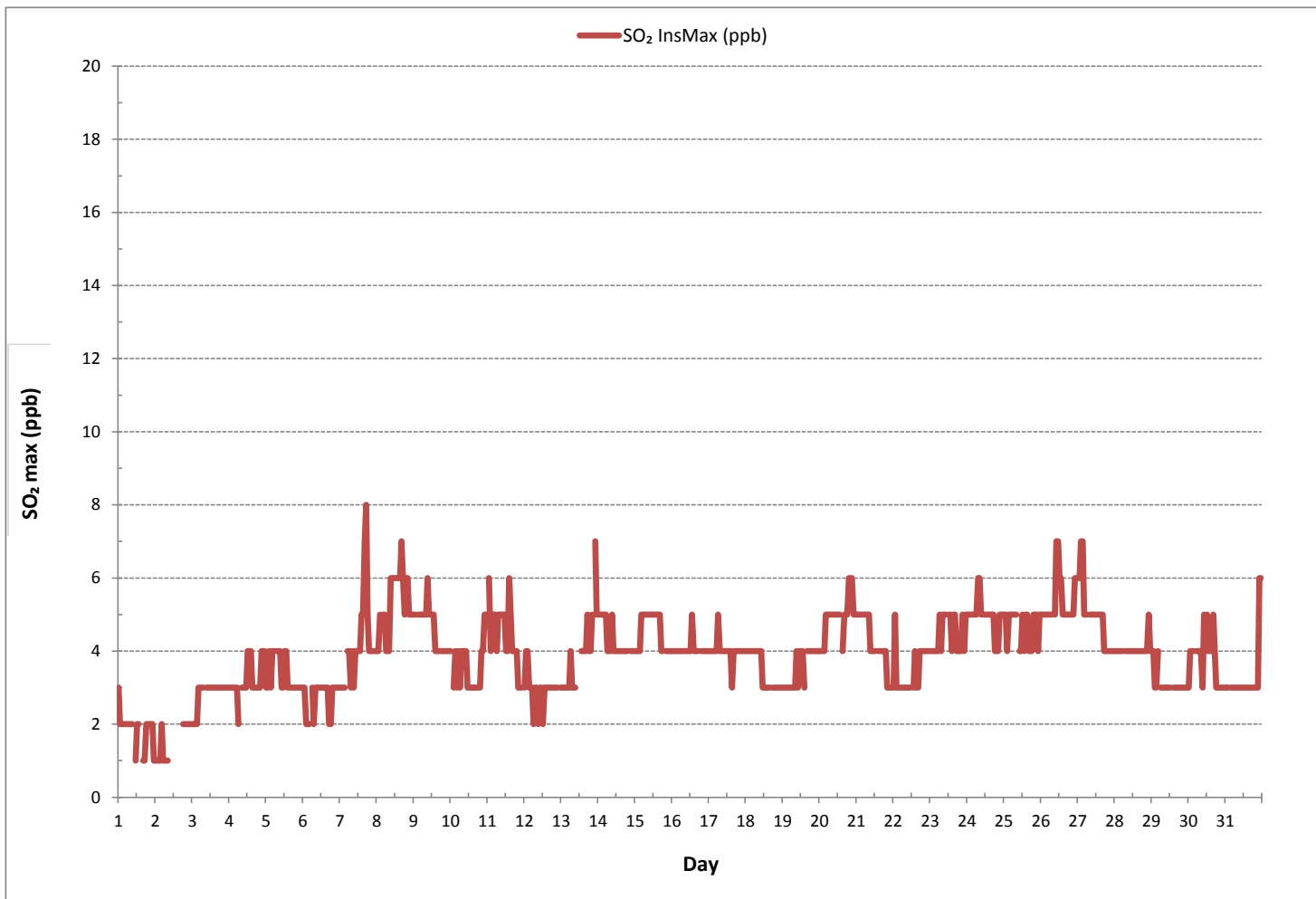
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	699
MAXIMUM INSTANTANEOUS VALUE:	8 ppb @ HOUR 17 ON DAY 7
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	743 hrs
STANDARD DEVIATION:	1

SULPHUR DIOXIDE Instantaneous Maximum (SO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - March 2018

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY 1	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
2	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
3	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
4	0	0	0	0	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24		
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C	C	C	C	C	0	0	0	0	0	0	24		
6	0	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	24		
7	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	1	24		
8	0	0	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24	
9	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
10	1	S	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	24	
11	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0	0	24	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
13	0	1	0	0	0	1	1	1	1	0	Q	Q	Q	1	1	1	1	1	1	1	1	1	S	1	1	0	1	1	24	
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	24	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	24	
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	24	
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
18	1	1	1	1	1	1	0	1	1	1	1	0	0	0	0	0	S	0	0	0	0	0	0	0	0	0	0	1	0	24
19	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	0	1	1	24	
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	24	
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	0	0	0	0	1	1	24	
22	1	0	0	0	0	0	0	0	0	0	0	0	0	S	1	1	1	1	1	1	1	1	1	1	1	0	1	1	24	
23	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
24	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
25	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
26	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
27	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
28	1	1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
29	1	1	0	0	0	S	0	0	0	0	0	0	0	0	P	0	0	0	0	0	0	0	0	1	0	0	1	0	23	
30	0	1	0	1	S	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	24	
31	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	1	0	24		
HOURLY MAX	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	
HOURLY AVG	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	

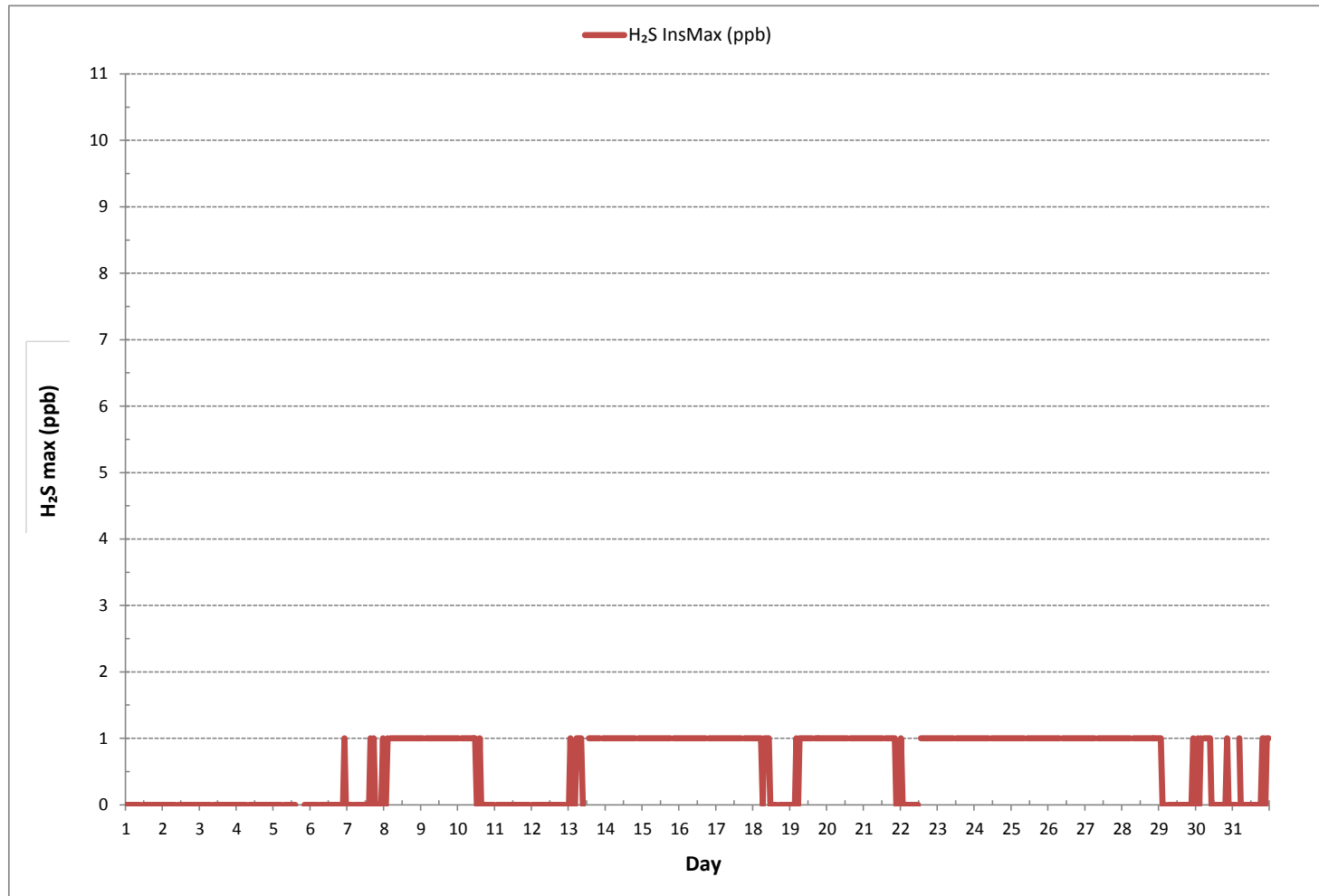
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	404
MAXIMUM INSTANTANEOUS VALUE:	1 ppb @ HOUR 22 ON DAY 6
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
OPERATIONAL TIME:	743 hrs
STANDARD DEVIATION:	0

HYDROGEN SULPHIDE Instantaneous Maximum (H₂S ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - March 2018

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	2.55	2.60	2.55	2.55	2.52	2.49	2.52	2.54	2.51	2.49	S	2.57	2.60	2.52	2.54	2.54	2.55	2.50	2.50	2.54	2.54	2.55	2.57	2.49	2.60	2.54	24	
2	2.58	2.58	2.55	2.55	2.52	2.55	2.55	2.55	2.55	S	2.54	2.54	2.57	2.51	2.49	2.52	2.52	2.52	2.46	2.42	2.37	2.32	2.24	2.21	2.21	2.58	2.49	24
3	2.21	2.21	2.21	2.18	2.16	2.18	2.17	2.15	S	2.15	2.18	2.15	2.12	2.14	2.15	2.16	2.16	2.17	2.20	2.18	2.20	2.19	2.21	2.23	2.12	2.23	2.18	24
4	2.23	2.23	2.21	2.23	2.21	2.23	2.21	S	2.27	2.29	2.30	2.30	2.30	2.30	2.30	2.32	2.33	2.31	2.30	2.40	2.30	2.32	2.30	2.29	2.21	2.40	2.28	24
5	2.29	2.29	2.30	2.27	2.27	2.30	S	2.27	2.27	2.27	2.27	2.35	C	C	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	2.27	2.35	2.29	15
6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	2.37	2.37	2.35	2.37	2.39	2.35	2.41	2.40	2.41	2.35	2.41	2.38	14
7	2.43	2.45	2.46	2.48	S	2.50	2.49	2.50	2.54	2.52	2.42	2.37	2.35	2.39	2.42	2.45	2.42	2.42	2.41	2.41	2.42	2.46	2.48	2.49	2.35	2.54	2.45	24
8	2.52	2.58	2.59	S	2.62	2.63	2.68	2.77	2.72	2.63	2.50	2.50	2.48	2.72	3.44	3.37	2.83	2.97	3.13	3.00	3.05	2.89	2.97	2.97	2.48	3.44	2.81	24
9	2.89	2.69	S	2.49	2.48	2.50	2.53	2.52	2.49	2.44	2.42	2.41	2.41	2.46	2.45	2.40	2.42	2.39	2.40	2.44	2.42	2.41	2.40	2.28	2.28	2.89	2.47	24
10	2.24	S	2.23	2.28	2.39	2.45	2.45	2.46	2.52	2.50	2.49	2.37	2.28	2.28	2.24	2.28	2.35	2.33	2.33	2.35	2.40	2.41	2.41	2.23	2.52	2.37	24	
11	S	2.44	2.46	2.48	2.43	2.48	2.50	2.49	2.45	2.46	2.48	2.40	2.29	2.41	2.44	2.41	2.32	2.37	2.35	2.36	2.36	2.40	2.39	S	2.29	2.50	2.42	24
12	2.39	2.41	2.40	2.39	2.37	2.40	2.41	2.39	2.40	2.40	2.45	2.45	2.37	2.32	2.35	2.37	2.37	2.39	2.40	2.41	2.51	2.75	S	2.78	2.32	2.78	2.43	24
13	2.72	2.72	2.63	2.58	2.54	2.51	2.54	2.63	2.64	2.55	2.54	S	Q	Q	Q	2.84	2.98	2.88	2.91	3.09	2.96	S	3.11	3.26	2.51	3.26	2.76	24
14	3.38	3.37	3.19	3.14	3.11	2.96	2.89	2.74	2.73	2.59	2.52	2.50	2.42	2.33	2.29	2.21	2.17	2.19	2.24	2.26	S	2.26	2.29	2.26	2.17	3.38	2.61	24
15	2.25	2.29	2.24	2.29	2.28	2.25	2.26	2.28	2.30	2.30	2.29	2.31	2.30	2.29	2.26	2.28	2.30	2.33	2.30	S	2.25	2.28	2.28	2.29	2.24	2.33	2.28	24
16	2.28	2.26	2.29	2.29	2.36	2.37	2.40	2.37	2.41	2.39	2.41	2.42	2.39	2.40	2.36	2.33	2.36	2.39	S	2.36	2.36	2.41	2.40	2.42	2.26	2.42	2.37	24
17	2.39	2.40	2.36	2.38	2.39	2.40	2.38	2.37	2.37	2.37	2.35	2.40	2.31	2.35	2.35	2.35	2.35	S	2.35	2.35	2.33	2.31	2.32	2.42	2.31	2.42	2.36	24
18	2.42	2.26	2.30	2.29	2.25	2.29	2.30	2.28	2.25	2.25	2.24	2.25	2.25	2.24	2.29	S	2.24	2.25	2.28	2.29	2.30	2.28	2.26	2.24	2.42	2.27	24	
19	2.35	2.35	2.35	2.40	2.38	2.37	2.48	2.55	2.63	2.64	2.59	2.59	2.58	2.54	2.50	S	2.35	2.33	2.32	2.37	2.36	2.39	2.44	2.42	2.32	2.64	2.45	24
20	2.40	2.45	2.44	2.48	2.45	2.46	2.48	2.52	2.52	2.56	2.56	2.50	2.37	2.25	S	2.19	2.14	2.14	2.29	2.35	2.36	2.35	2.35	2.35	2.14	2.56	2.39	24
21	2.33	2.30	2.33	2.33	2.35	2.59	2.67	2.78	2.84	2.86	2.72	2.58	2.49	S	2.36	2.33	2.31	2.30	2.31	2.29	2.29	2.32	2.33	2.32	2.29	2.86	2.45	24
22	2.33	2.33	2.35	2.35	2.31	2.36	2.33	2.35	2.36	2.35	2.36	2.35	S	2.34	2.33	2.25	2.26	2.28	2.36	2.33	2.33	2.30	2.33	2.30	2.25	2.36	2.33	24
23	2.33	2.30	2.32	2.29	2.29	2.28	2.28	2.32	2.28	2.35	2.30	S	2.28	2.33	2.31	2.33	2.35	2.33	2.66	2.45	2.40	2.39	2.36	2.39	2.28	2.66	2.34	24
24	2.40	2.64	2.74	2.63	2.45	2.41	2.35	2.33	2.36	2.39	S	2.39	2.33	2.30	2.25	2.19	2.14	2.11	2.21	2.26	2.33	2.30	2.28	2.29	2.11	2.74	2.35	24
25	2.29	2.29	2.33	2.33	2.31	2.35	2.40	2.40	2.38	S	2.35	2.31	2.30	2.29	2.32	2.33	2.35	2.40	2.40	2.56	2.58	2.33	2.41	2.46	2.29	2.58	2.37	24
26	2.49	2.72	2.84	2.77	2.63	2.45	2.37	2.40	S	2.39	2.40	2.39	2.36	2.35	2.24	2.21	2.19	2.15	2.25	2.32	2.35	2.33	2.33	2.35	2.15	2.84	2.40	24
27	2.36	2.36	2.33	2.35	2.31	2.33	2.26	S	2.29	2.29	2.28	2.32	2.28	2.26	2.29	2.28	2.28	2.30	2.32	2.33	2.31	2.30	2.32	2.30	2.26	2.36	2.31	24
28	2.32	2.32	2.35	2.32	2.36	2.37	S	2.39	2.37	2.35	2.32	2.31	2.32	2.33	2.35	2.35	2.32	2.32	2.35	2.32	2.30	2.32	2.39	2.36	2.30	2.39	2.34	24
29	2.35	2.36	2.36	2.39	2.40	S	2.44	2.41	2.39	2.37	2.41	2.45	2.36	P	2.35	2.35	2.36	2.37	2.40	2.48	2.46	2.42	2.42	2.47	2.35	2.48	2.40	23
30	2.45	2.46	2.49	2.52	2.60	2.63	2.66	2.67	2.80	S	2.42	2.35	2.36	2.35	2.35	2.35	2.36	2.37	2.39	2.37	2.37	2.36	2.36	2.36	2.35	2.80	2.45	24
31	2.37	2.37	2.37	S	2.36	2.38	2.41	2.38	2.36	2.36	2.37	2.37	2.39	2.36	2.35	2.35	2.36	2.35	2.36	2.40	2.40	2.41	2.41	2.41	2.35	2.41	2.38	24
HOURLY MAX	3.38	3.37	3.19	3.14	3.11	2.96	2.89	2.78	2.84	2.86	2.72	2.59	2.60	2.72	3.44	3.37	2.98	2.97	3.13	3.09	3.05	2.89	3.11	3.26				
HOURLY AVG	2.43	2.45	2.43	2.43	2.42	2.43	2.44	2.46	2.46	2.43	2.41	2.40	2.37	2.36	2.28	2.38	2.36	2.36	2.40	2.41	2.41	2.39	2.41	2.43				

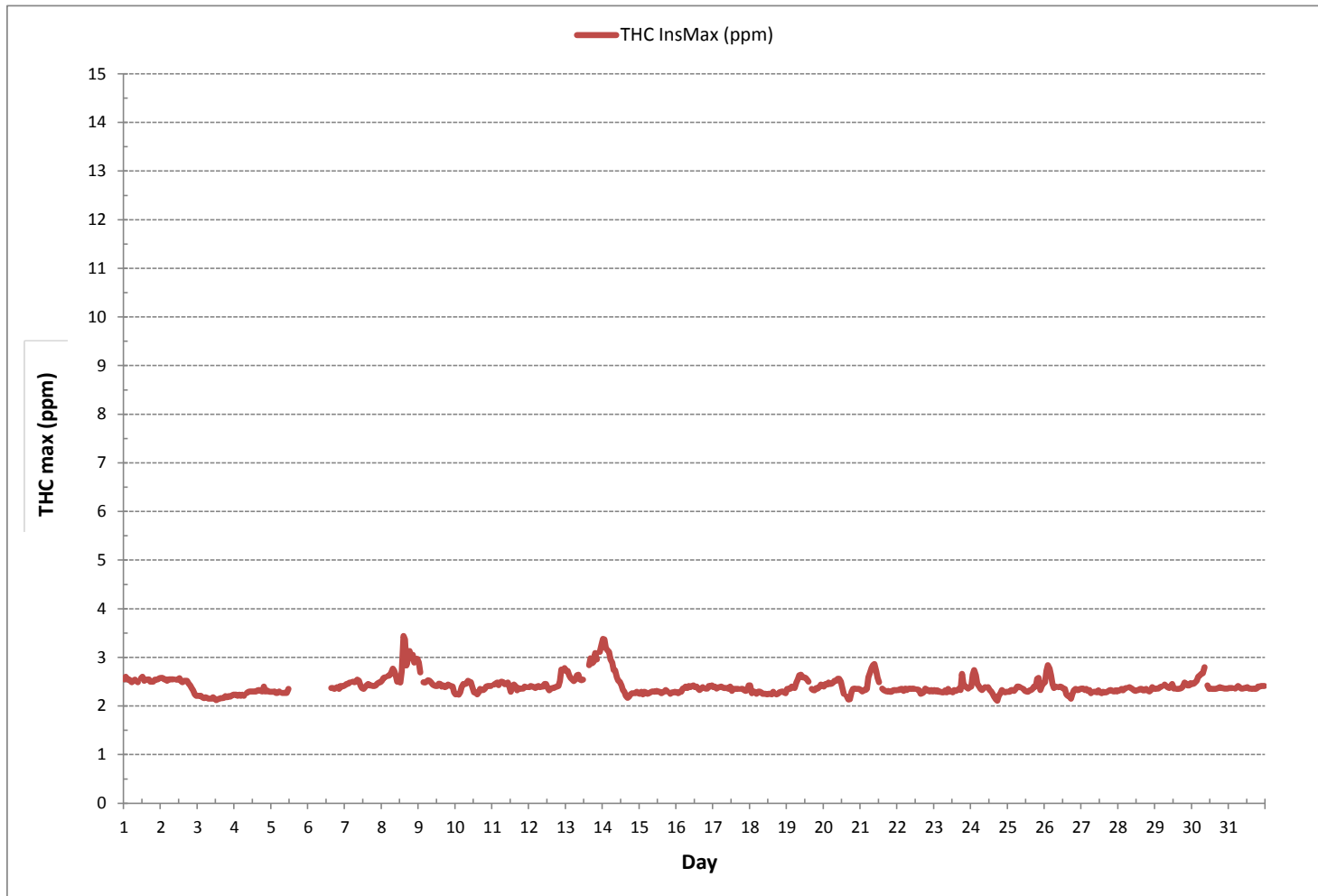
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	682
MAXIMUM INSTANTANEOUS VALUE:	3.44 ppm @ HOUR 14 ON DAY 8
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	8 hrs
OPERATIONAL TIME:	724 hrs
STANDARD DEVIATION:	0.18

TOTAL HYDROCARBONS Instantaneous Maximum (THC ppm)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - March 2018

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	2	2	2	1	1	2	1	2	2	13
1	1	1	1	1	1	1	1	1	1	1	S	3	1	7	1	1	1	1	1	1	1	1	1	1	1	7	1	24
2	1	1	1	1	1	1	1	1	1	S	4	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	24	
3	1	1	1	1	1	1	1	1	S	4	3	5	3	3	3	2	2	3	3	3	3	3	3	1	5	2	24	
4	3	3	3	3	3	3	S	7	5	16	4	3	20	3	3	2	20	2	2	2	2	2	2	2	20	5	24	
5	3	3	3	3	18	S	6	4	25	4	19	3	15	19	3	2	3	3	2	3	16	5	5	6	2	25	8	
6	6	6	6	5	S	9	7	8	7	35	25	6	6	6	19	27	10	10	5	5	4	6	6	4	35	10	24	
7	6	8	8	S	11	8	8	11	10	10	10	10	10	12	17	17	10	10	11	9	8	7	6	6	17	10	24	
8	5	4	S	7	5	4	4	4	4	4	4	4	4	4	4	4	15	3	3	4	4	4	3	3	15	5	24	
9	2	S	6	3	3	4	4	8	26	20	39	9	6	5	5	5	11	4	3	4	5	6	6	2	39	8	24	
10	S	8	6	6	6	6	6	6	7	8	8	8	7	17	23	4	3	4	4	3	3	4	3	3	23	7	24	
11	7	4	4	4	4	6	11	5	6	4	5	4	4	4	4	4	7	8	4	6	6	S	8	4	11	5	24	
12	6	6	5	6	5	6	5	6	6	6	Q	Q	Q	Q	6	7	8	8	8	10	8	S	11	9	5	11	7	
13	9	8	7	7	7	6	6	6	7	6	6	5	4	4	4	3	3	3	3	3	S	7	4	3	9	5	24	
14	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	S	6	3	3	2	6	3	24	
15	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	13	4	3	S	11	6	4	4	4	2	13	4	
16	4	4	4	4	4	4	4	4	4	5	3	4	4	3	4	3	3	S	7	7	3	3	3	4	3	7	4	
17	4	4	3	4	4	4	3	4	5	4	3	2	1	2	2	2	S	6	3	2	2	1	2	1	1	6	3	
18	2	2	2	2	2	2	3	3	4	4	4	4	3	3	4	S	6	3	3	3	3	3	3	4	2	6	3	
19	3	3	4	4	4	4	6	5	6	8	8	8	6	6	S	10	6	17	9	12	7	7	6	6	3	17	7	
20	6	4	5	5	4	7	10	10	9	8	6	4	4	S	8	4	4	4	4	3	3	3	2	2	10	5	24	
21	1	1	1	2	1	1	1	1	1	1	2	1	1	S	6	3	3	3	3	2	2	2	2	2	1	6	2	
22	2	1	2	2	2	2	2	2	2	2	2	2	S	6	3	3	3	3	3	2	2	2	2	2	1	6	2	
23	3	5	6	5	4	3	3	4	6	4	S	26	3	3	3	2	2	1	1	1	1	1	1	1	1	26	4	
24	1	1	1	1	1	2	3	4	3	S	6	3	2	2	3	3	25	2	2	2	2	3	3	1	25	3	24	
25	3	4	4	4	4	4	4	4	4	S	8	31	8	9	8	7	5	4	3	3	4	2	3	3	2	31	6	
26	3	3	3	3	1	1	1	S	5	2	1	1	1	1	1	1	1	2	1	1	3	1	1	1	1	5	2	
27	1	1	1	1	1	1	S	16	3	21	11	1	1	1	3	1	1	3	1	3	1	1	3	1	21	3	24	
28	1	1	1	1	3	S	5	3	2	1	1	1	1	P	1	1	1	1	1	1	3	3	1	1	1	5	2	
29	2	1	1	1	S	6	5	5	11	11	4	2	2	1	1	1	1	1	1	1	1	1	1	1	11	3	24	
30	1	1	1	S	3	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	2	4	6	1	6	2	
31	9	8	8	7	18	9	11	16	26	35	39	26	20	19	23	27	25	17	11	12	16	7	11	9				
HOURLY MAX	3	3	3	3	4	4	4	5	6	7	8	5	5	5	5	5	5	4	3	4	4	3	3	3				
HOURLY AVG																												

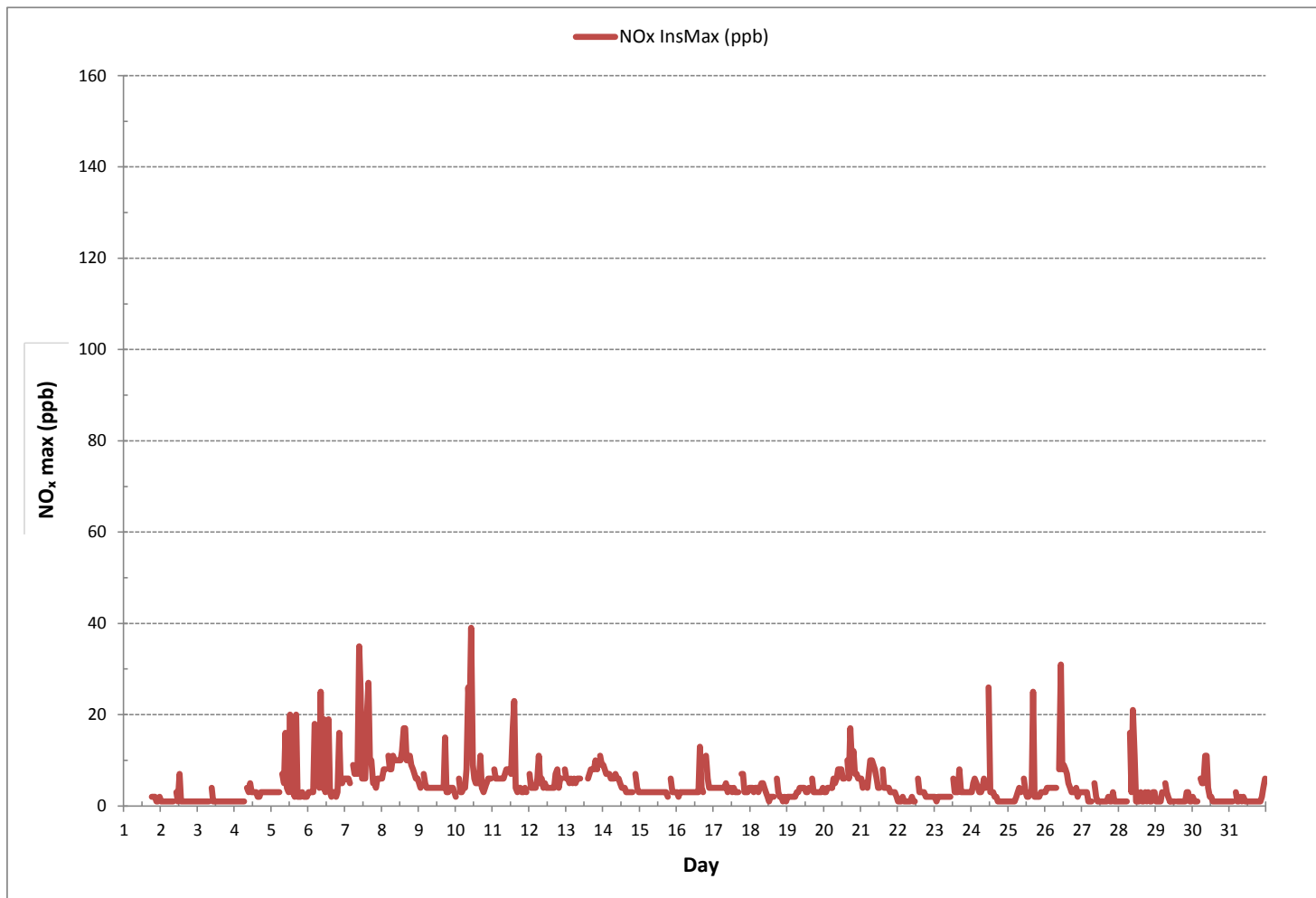
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	690
MAXIMUM INSTANTANEOUS VALUE:	39 ppb @ HOUR 10 ON DAY 10
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	732 hrs
STANDARD DEVIATION:	4

OXIDES OF NITROGEN Instantaneous Maximum (NO_x ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - March 2018

NITRIC OXIDE Instantaneous Maximum (NO ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.							
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.								
DAY																																			
1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	0	0	0	0	0	0	0	0	0	0	0	0	0	13		
2	0	0	0	0	0	0	0	0	0	0	S	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
3	0	0	0	0	0	0	0	0	0	S	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	24
4	0	0	0	0	0	0	0	0	S	1	0	1	1	1	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	24
5	0	1	0	0	0	0	S	1	1	8	1	1	1	12	1	1	1	14	0	0	1	1	0	1	0	0	0	0	0	0	14	2	24		
6	0	0	0	0	7	S	1	1	24	1	10	2	8	11	1	1	1	1	1	0	1	11	1	0	0	0	0	24	4	24					
7	0	0	1	1	S	1	1	2	2	17	17	2	3	2	10	12	3	2	0	0	0	0	1	1	1	0	17	3	24						
8	0	1	1	S	1	1	1	1	2	3	2	3	3	3	5	5	2	1	1	1	1	1	1	1	1	0	5	2	24						
9	1	0	S	1	1	0	0	0	1	1	1	1	1	1	1	1	1	5	1	0	0	0	0	0	0	0	5	1	24						
10	0	S	0	0	0	0	0	1	15	8	22	3	1	1	1	1	7	1	1	0	0	0	0	0	0	0	22	3	24						
11	S	1	0	0	0	0	0	1	1	1	2	2	1	5	8	1	0	1	0	0	0	0	0	0	S	0	8	1	24						
12	1	0	0	0	0	1	3	1	1	1	1	1	1	1	1	0	0	1	1	0	1	0	S	1	0	3	1	24							
13	0	1	1	0	0	0	0	1	1	1	Q	Q	Q	Q	1	1	1	1	1	1	1	0	S	1	1	0	1	1	24						
14	1	1	0	1	1	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	S	1	1	0	0	1	1	24						
15	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	S	1	0	0	0	0	0	1	0	24						
16	0	0	1	0	0	0	0	1	1	1	1	1	1	1	0	4	1	0	S	1	1	0	0	0	0	0	4	1	24						
17	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	S	1	1	0	0	0	0	0	1	0	24						
18	0	0	0	1	0	1	1	1	1	1	1	1	0	1	1	0	S	1	0	0	0	0	0	0	0	0	1	0	24						
19	0	0	0	0	1	0	0	1	1	1	1	1	1	1	1	S	1	0	0	0	0	0	0	0	1	0	1	0	24						
20	0	0	0	1	0	1	1	1	1	1	2	1	1	1	S	1	1	4	1	1	1	1	0	0	0	0	4	1	24						
21	1	0	0	1	0	0	1	1	1	1	1	1	1	S	1	1	1	1	1	1	0	0	0	0	0	0	1	1	24						
22	0	0	0	0	0	0	0	0	0	1	0	1	S	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	24						
23	0	0	0	0	0	0	0	0	0	0	0	S	1	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	24						
24	0	1	0	1	0	0	0	5	2	1	S	14	1	1	1	1	0	0	0	0	0	0	0	1	0	0	14	1	24						
25	0	0	0	0	0	1	1	1	1	S	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0	0	11	1	24						
26	0	0	0	0	1	1	1	1	S	2	9	3	3	3	1	1	1	1	1	0	0	0	0	0	0	0	9	1	24						
27	0	0	0	0	0	0	1	S	1	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	0	1	0	24							
28	1	0	0	1	0	1	S	6	1	15	8	1	0	1	1	1	0	1	0	1	0	1	1	0	0	1	15	2	24						
29	0	0	0	0	1	S	1	1	1	1	1	1	1	P	1	1	0	1	1	1	1	1	0	0	0	1	1	23							
30	1	0	1	1	S	1	1	1	4	5	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	5	1	24						
31	0	0	0	S	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0	0	1	1	24						
HOURLY MAX	1	1	1	1	7	1	3	6	24	17	22	14	12	11	10	12	14	5	1	1	11	1	1	1	1	0	1	1	24						
HOURLY AVG	0	0	0	0	1	0	1	1	2	3	3	2	2	2	1	1	2	1	0	0	1	0	0	0	0	0	0	0	24						

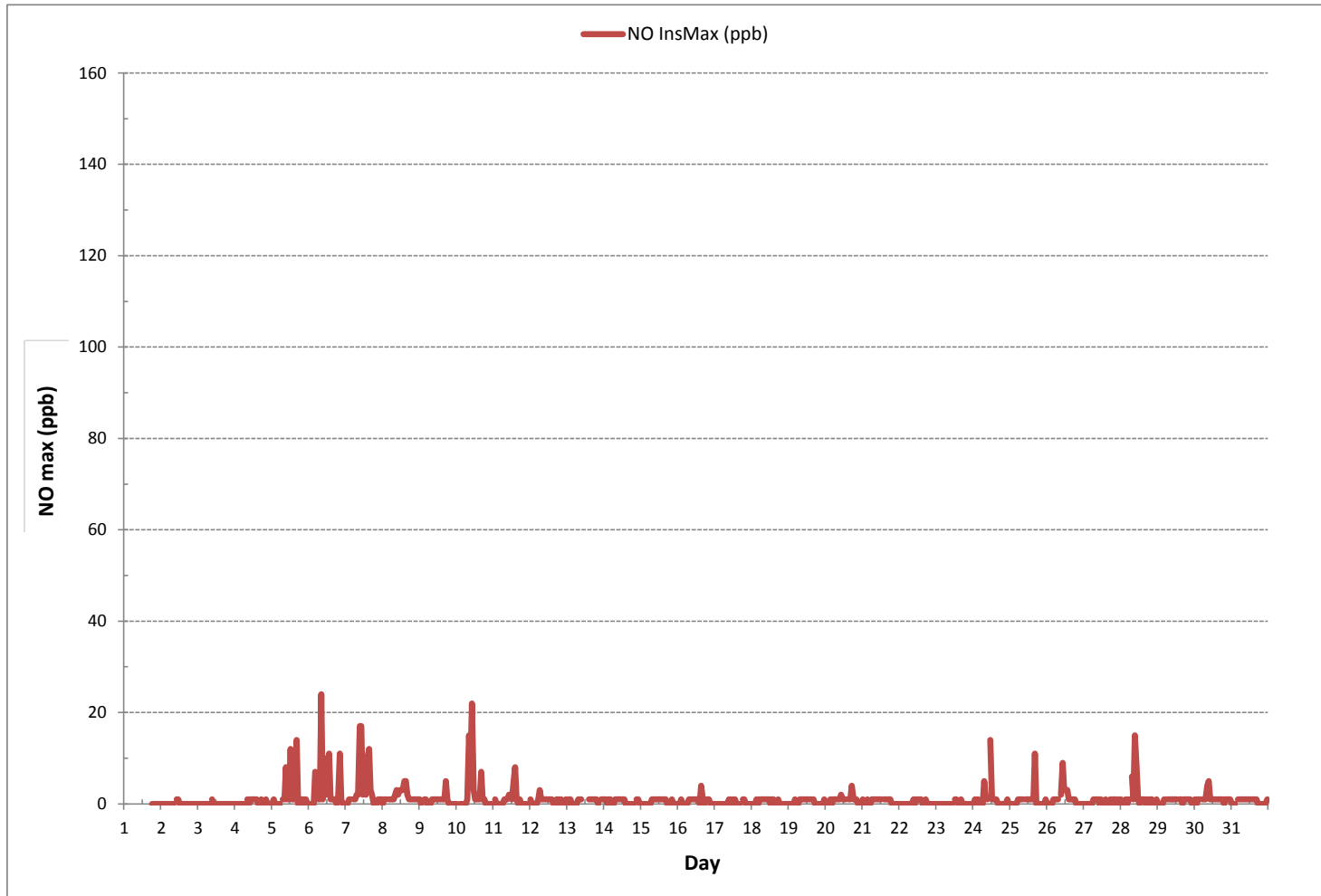
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	358
MAXIMUM INSTANTANEOUS VALUE:	24 ppb @ HOUR 8 ON DAY 6
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
STANDARD DEVIATION:	2
OPERATIONAL TIME:	732 hrs

NITRIC OXIDE Instantaneous Maximum (NO ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
St. Lina Continuous Monitoring Station - March 2018

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.		
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.			
DAY	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	C	C	C	C	C	C	C	2	2	2	2	1	2	1	2	2	13		
1	1	1	1	1	1	1	1	1	1	1	S	3	2	7	1	1	1	1	1	1	1	1	1	1	1	1	7	1	24	
2	1	1	1	1	0	1	1	1	1	S	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	3	1	24	
3	1	1	1	1	1	1	1	1	S	4	3	4	3	3	2	2	2	2	3	2	2	3	3	3	3	1	4	2	24	
4	3	3	3	3	3	3	S	7	4	8	3	2	8	2	2	1	7	2	1	2	2	2	2	2	2	1	8	3	24	
5	3	3	3	3	11	S	5	3	4	3	9	2	10	9	2	1	2	3	1	3	7	4	5	6	1	11	11	4	24	
6	6	5	5	5	S	8	7	7	6	21	9	4	4	4	4	11	16	7	8	5	4	4	5	4	6	4	21	7	24	
7	6	7	8	S	10	7	8	10	8	8	8	8	8	8	9	12	12	8	9	11	9	8	7	6	6	6	12	8	24	
8	5	4	S	7	4	4	4	4	4	4	4	3	4	3	3	3	3	10	3	3	4	4	3	3	3	10	10	4	24	
9	2	S	5	3	3	3	4	7	14	13	18	7	4	4	4	4	9	4	3	4	4	5	6	6	6	2	18	6	24	
10	S	7	6	6	6	6	6	6	7	7	6	7	6	11	16	4	3	4	3	3	3	3	3	S	3	3	16	6	24	
11	6	4	4	4	4	4	9	4	5	4	4	4	4	4	4	4	6	8	4	5	6	S	8	4	9	5	9	5	24	
12	6	5	5	6	5	5	4	5	5	5	5	Q	Q	Q	Q	5	7	7	8	8	10	8	S	10	9	4	10	6	24	
13	8	8	7	7	7	6	6	6	6	6	5	4	4	4	3	3	3	3	3	3	3	S	6	3	3	3	8	5	5	24
14	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	S	5	3	3	2	2	5	3	3	24
15	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	8	4	3	S	10	4	4	4	4	4	2	10	4	4	24
16	4	3	4	4	4	4	4	4	4	5	3	3	4	3	4	3	3	3	S	6	6	3	3	3	4	3	6	4	2	24
17	4	3	3	3	3	3	3	4	4	3	2	1	1	1	1	1	S	5	2	2	2	2	1	1	1	1	5	2	2	24
18	1	1	2	1	1	2	2	3	4	3	3	3	3	3	3	S	6	3	3	3	3	3	3	3	3	1	6	3	3	24
19	3	3	3	3	3	4	5	5	6	7	7	7	6	5	S	9	5	13	8	11	7	7	6	6	3	13	6	3	6	24
20	5	4	5	4	4	7	9	9	8	7	6	4	4	S	7	4	4	4	4	3	3	3	2	1	1	1	9	5	5	24
21	1	1	1	1	1	1	1	1	1	1	1	1	1	S	5	3	2	2	2	2	2	2	1	1	2	1	1	5	2	24
22	1	1	1	2	1	2	2	2	2	2	2	2	S	5	3	3	3	8	3	2	3	3	3	3	3	1	8	3	3	24
23	3	5	6	4	4	3	3	4	4	3	S	14	3	2	2	2	2	2	1	1	1	1	1	1	1	1	14	3	3	24
24	1	1	1	1	1	1	3	3	3	S	4	2	1	1	2	2	14	2	2	2	2	2	2	3	1	14	2	14	2	24
25	3	4	4	4	4	3	3	3	S	7	23	6	6	6	5	4	3	3	3	3	3	4	2	2	3	2	23	3	3	24
26	3	3	3	3	1	1	1	S	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	24
27	1	1	0	1	1	1	S	10	2	9	4	1	1	1	1	1	1	1	2	1	2	1	1	2	3	0	10	2	2	24
28	1	0	1	1	2	S	4	3	1	1	1	1	1	1	P	1	0	0	1	1	1	3	3	1	1	0	4	1	1	23
29	1	1	1	1	S	4	4	4	7	7	2	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	7	2	2	24
30	0	0	0	S	3	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	4	5	0	5	1	1	24
31	HR	HR	HR	7	11	8	9	10	14	21	23	14	10	11	16	16	14	13	11	11	8	7	10	9						
	MAX	8	8	8	7	11	8	9	10	14	21	23	14	10	11	16	16	14	13	11	11	8	7	10	9					
	AVG	3	3	3	3	3	4	4	4	5	5	5	4	4	3	4	4	4	4	3	3	3	3	3	3					

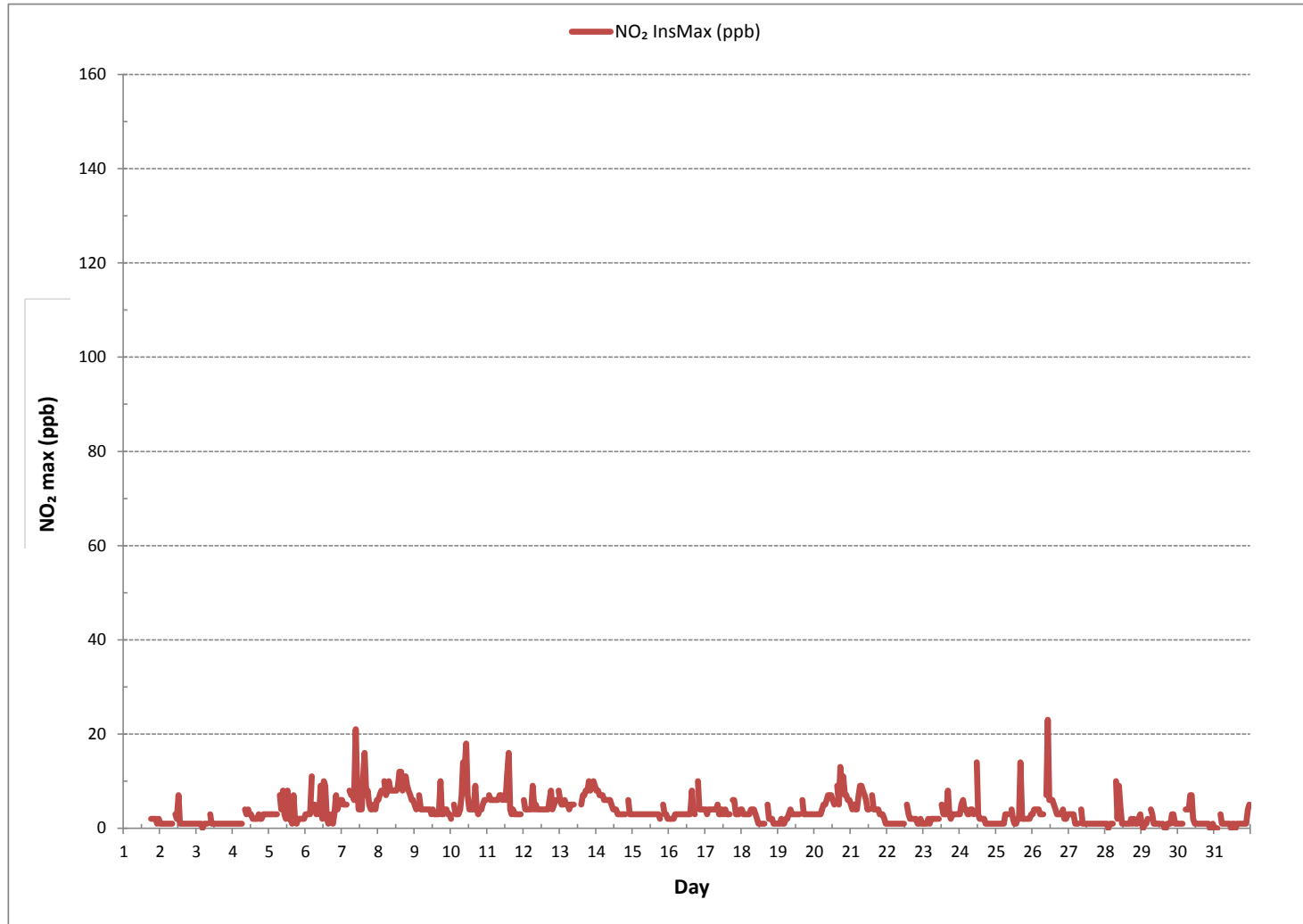
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	678
MAXIMUM INSTANTANEOUS VALUE:	23 ppb @ HOUR 10 ON DAY 26
	VAR-VARIOUS
IZS CALIBRATION TIME:	31 hrs
MONTHLY CALIBRATION TIME:	7 hrs
OPERATIONAL TIME:	732 hrs
STANDARD DEVIATION:	3

NITROGEN DIOXIDE Instantaneous Maximum (NO₂ ppb)





LAKELAND INDUSTRY & COMMUNITY ASSOCIATION
 St. Lina Continuous Monitoring Station - March 2018

OZONE Instantaneous Maximum (O₃ ppb)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY 1	35.7	35.0	34.8	35.5	36.0	36.6	37.5	38.1	39.0	40.2	S	C	C	C	C	C	43.4	42.3	41.3	40.8	39.4	39.7	39.7	40.0	34.8	43.4	38.6	24
2	40.3	39.8	39.0	38.7	38.3	38.0	37.9	37.5	37.5	S	37.7	38.3	37.2	38.0	39.2	39.6	Q	Q	38.5	38.9	40.3	39.9	37.3	36.8	36.8	40.3	38.5	24
3	36.6	36.4	36.2	36.4	37.2	38.4	39.3	39.6	S	39.3	39.6	39.8	40.3	40.6	41.8	41.8	42.0	42.1	42.4	42.4	42.3	42.0	41.9	41.5	36.2	42.4	40.0	24
4	41.1	40.9	40.6	39.4	38.7	38.4	38.0	S	40.6	39.7	37.6	38.5	39.2	40.6	43.6	44.3	44.0	43.1	42.0	41.5	40.3	37.6	36.6	31.8	31.8	44.3	39.9	24
5	31.5	31.3	29.6	29.7	29.8	28.6	S	26.0	28.0	28.8	32.9	35.6	38.4	38.4	41.9	42.4	42.1	42.0	41.6	40.3	40.3	39.7	38.9	37.9	26.0	42.4	35.5	24
6	36.0	34.2	33.2	33.1	33.2	S	33.1	32.7	33.0	33.0	33.8	34.9	36.2	36.6	37.5	38.1	39.2	39.3	39.7	38.9	37.1	35.2	34.3	33.5	32.7	39.7	35.5	24
7	33.0	33.4	33.0	33.0	S	31.3	31.3	31.3	30.6	34.9	35.8	36.2	38.0	39.6	41.4	37.6	38.4	45.9	48.7	52.2	52.1	51.1	50.4	49.4	30.6	52.2	39.5	24
8	47.7	45.2	41.5	S	40.6	39.3	38.4	37.7	36.8	38.2	44.0	45.5	45.6	45.8	44.8	48.2	49.7	48.9	46.3	47.8	47.1	45.5	45.5	45.9	36.8	49.7	44.2	24
9	47.0	47.1	S	46.4	45.5	45.9	46.6	46.3	46.3	46.1	46.1	46.4	46.5	46.8	46.5	47.1	47.2	47.0	46.3	46.0	46.7	47.1	46.4	45.5	47.2	46.5	24	
10	46.5	S	47.1	46.3	45.1	43.8	43.0	40.9	36.2	37.3	40.1	46.4	48.6	49.5	51.7	52.2	53.1	54.3	54.1	54.5	54.0	52.0	49.9	49.4	36.2	54.5	47.7	24
11	S	46.9	46.3	45.5	44.7	44.9	45.6	46.6	46.6	48.1	49.9	53.0	57.0	58.6	59.9	59.8	57.9	58.2	58.7	59.0	59.6	58.9	57.9	S	44.7	59.9	52.9	24
12	57.0	55.7	55.0	54.8	55.2	55.3	54.1	53.4	53.1	53.5	53.9	56.0	57.8	58.6	59.6	60.6	61.0	61.0	59.5	57.8	58.4	58.4	S	56.8	53.1	61.0	56.8	24
13	56.1	54.5	53.4	52.5	51.8	51.7	52.0	51.6	51.3	53.1	53.1	54.4	Q	Q	59.6	66.3	72.8	65.5	61.1	56.6	56.0	S	54.3	52.4	51.3	72.8	56.2	24
14	52.9	53.5	54.3	53.7	53.4	53.9	54.9	56.5	55.9	58.2	59.8	61.7	64.4	64.9	63.8	63.0	61.9	60.9	59.5	57.8	S	56.9	56.6	55.3	52.9	64.9	58.0	24
15	54.5	53.5	52.4	51.5	50.7	49.8	49.0	48.4	48.5	48.9	50.3	52.8	54.9	56.5	58.1	58.7	56.6	53.3	51.2	S	50.8	50.2	49.4	48.2	48.2	58.7	52.1	24
16	47.1	46.4	45.5	45.2	44.6	44.0	43.6	43.6	43.8	44.0	44.6	45.2	46.7	50.0	53.3	55.0	56.2	57.7	S	58.9	58.9	58.8	63.4	64.0	43.6	64.0	50.5	24
17	62.4	62.1	61.2	61.7	60.0	54.9	53.8	51.5	52.1	53.4	51.1	50.5	52.0	52.2	52.9	53.7	S	53.4	52.9	51.8	54.5	51.1	49.3	49.3	62.4	54.4	24	
18	45.8	43.1	42.4	40.6	40.2	40.0	38.5	37.0	37.3	38.5	39.7	41.0	41.7	41.9	41.9	42.3	S	42.0	41.5	41.3	40.3	39.8	39.6	39.0	37.0	45.8	40.7	24
19	38.3	37.7	37.3	36.8	36.3	36.2	35.1	33.6	33.6	36.6	37.1	41.1	45.6	45.1	47.1	S	55.8	57.3	57.4	56.9	57.3	57.1	56.0	55.3	33.6	57.4	44.8	24
20	54.8	54.9	54.8	54.1	54.2	51.8	50.8	49.0	47.7	47.3	46.6	48.1	49.1	52.4	S	55.8	52.2	51.6	51.2	50.3	48.9	48.0	48.5	48.2	46.6	55.8	50.9	24
21	49.5	50.3	51.1	50.8	49.8	48.5	37.5	38.8	40.1	42.4	46.9	48.6	49.3	S	44.2	43.8	41.9	40.6	40.7	41.0	40.9	41.0	41.5	41.7	37.5	51.1	44.4	24
22	41.8	41.7	41.5	40.9	40.1	38.9	37.6	37.9	38.8	40.9	40.6	40.7	S	42.6	43.4	43.2	42.3	47.8	57.1	56.9	54.9	52.8	52.4	51.3	37.6	57.1	44.6	24
23	50.9	50.7	50.6	50.5	49.9	48.6	47.3	46.0	45.1	44.0	43.4	S	43.5	43.8	44.0	44.3	45.0	44.9	45.4	44.4	44.2	44.8	45.1	47.5	43.4	50.9	46.3	24
24	48.5	49.9	47.1	49.0	49.4	48.4	45.8	45.9	48.4	48.1	S	40.5	41.5	43.8	44.4	44.3	42.4	41.9	41.1	39.8	39.4	40.1	41.0	43.1	39.4	49.9	44.5	24
25	43.8	38.2	38.4	37.5	37.7	37.1	34.4	33.0	35.8	S	38.1	39.2	41.0	43.1	43.3	44.3	44.6	45.1	45.1	44.3	43.9	43.6	42.8	42.8	33.0	45.1	40.7	24
26	43.0	41.9	42.9	42.9	45.1	46.7	46.7	46.4	S	45.1	45.0	43.5	44.4	46.1	50.3	50.5	48.1	41.9	36.3	35.1	34.5	35.5	35.1	33.5	33.5	50.5	42.6	24
27	34.3	34.9	32.7	33.2	34.3	35.8	37.2	S	37.3	38.0	38.1	38.1	39.0	39.2	39.6	39.7	39.8	39.8	38.8	38.9	38.8	38.4	36.7	36.2	32.7	39.8	37.3	24
28	36.2	36.3	37.3	36.8	36.2	36.1	S	34.3	34.4	36.5	37.9	38.9	39.9	40.3	41.6	43.2	43.4	43.6	43.9	44.0	43.8	43.6	43.1	42.7	34.3	44.0	39.7	24
29	42.8	42.8	42.5	42.2	41.1	S	38.4	39.3	40.0	40.1	40.3	41.1	41.8	P	43.4	44.2	44.4	45.4	44.7	43.8	43.4	43.4	43.2	42.8	38.4	45.4	42.3	23
30	42.5	42.8	43.5	43.4	S	39.8	39.9	40.2	41.1	39.2	39.4	40.5	40.3	41.4	40.5	40.3	39.7	39.6	38.9	38.9	38.9	38.5	39.2	39.6	38.5	43.5	40.4	24
31	39.9	39.2	39.3	S	38.5	38.6	38.8	38.8	40.5	42.7	43.5	44.7	42.6	44.2	44.6	46.8	47.6	48.0	48.8	49.8	50.0	49.1	48.0	40.5	38.5	50.0	43.7	24
HOURLY MAX	62.4	62.1	61.2	61.7	60.0	55.3	54.9	56.5	55.9	58.2	59.8	61.7	64.4	64.9	63.8	66.3	72.8	65.5	61.1	59.0	59.6	58.9	63.4	64.0				
HOURLY AVG	44.6	44.0	43.5	43.4	42.8	42.3	41.4	41.4	42.6	43.0	44.2	45.1	45.9	47.0	47.9	48.5	48.0	47.2	47.1	46.5	46.1	45.6	44.8					

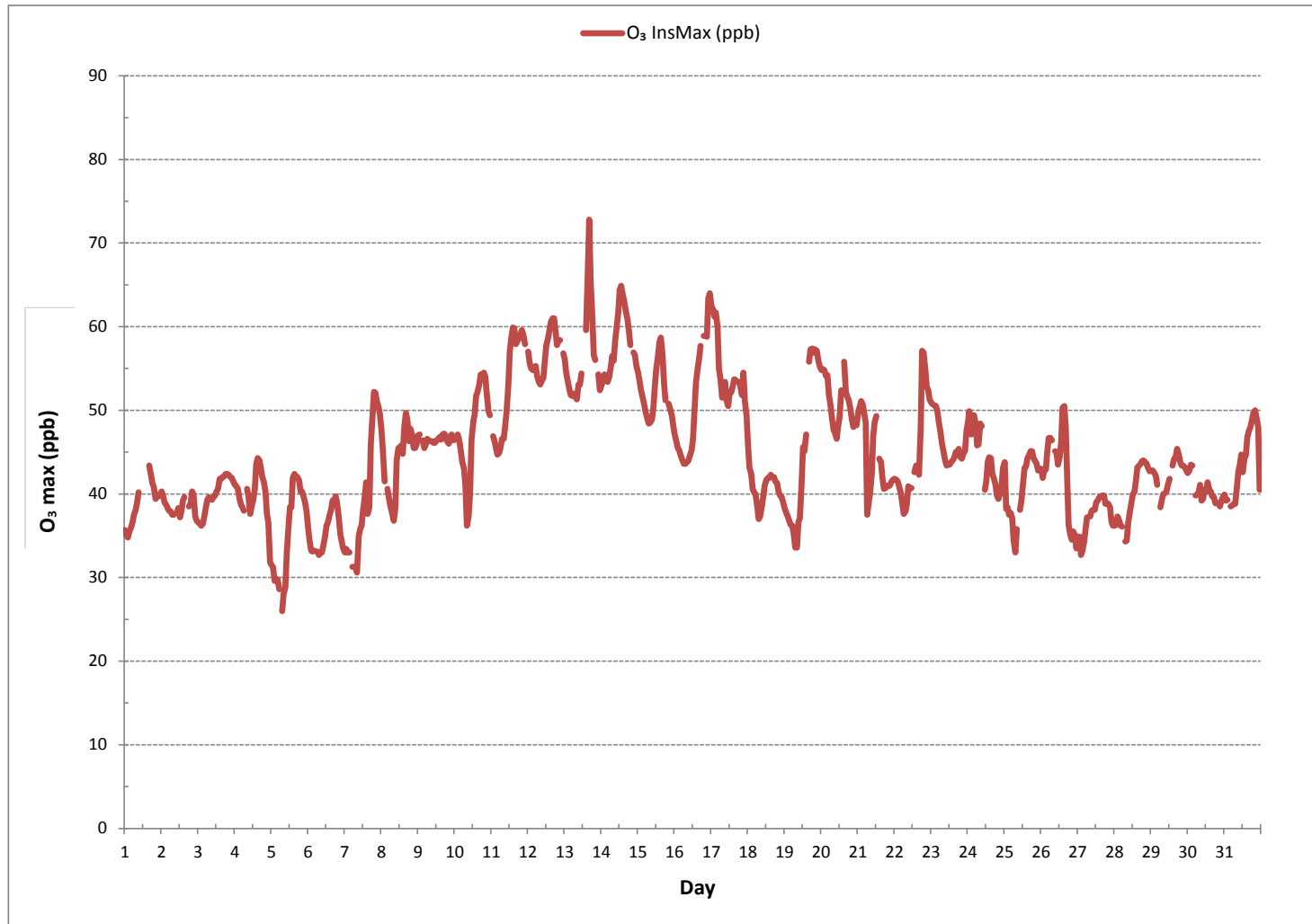
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

NUMBER OF NON-ZERO READINGS:	702
MAXIMUM INSTANTANEOUS VALUE:	72.8 ppb @ HOUR 16 ON DAY 13
IZS CALIBRATION TIME:	32 hrs
MONTHLY CALIBRATION TIME:	5 hrs
STANDARD DEVIATION:	7.6
OPERATIONAL TIME:	743 hrs

OZONE Instantaneous Maximum (O₃ ppb)





WIND SPEED Instantaneous Maximum (WS kph)

HR START (MST)	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	DAILY	DAILY	24-HR	RDGS.
HR END (MST)	0:59	1:59	2:59	3:59	4:59	5:59	6:59	7:59	8:59	9:59	10:59	11:59	12:59	13:59	14:59	15:59	16:59	17:59	18:59	19:59	20:59	21:59	22:59	23:59	MIN.	MAX.	AVG.	
DAY																												
1	25.8	24.7	26.0	26.2	27.5	27.5	32.3	31.2	32.1	40.4	49.9	56.6	45.5	44.6	44.7	52.3	46.9	41.8	29.4	40.4	41.5	46.1	57.3	50.5	24.7	57.3	39.2	24
2	36.2	36.5	53.6	57.5	51.7	51.3	41.7	53.7	66.4	57.5	56.4	49.4	53.1	52.5	49.2	56.9	52.7	51.3	59.4	60.2	55.3	62.7	57.5	50.9	36.2	66.4	53.1	24
3	47.9	55.6	44.4	56.9	56.6	59.0	60.8	57.2	61.2	62.9	60.1	61.7	57.7	49.4	46.4	46.6	36.9	39.1	34.3	36.9	44.8	34.3	31.3	27.5	27.5	62.9	48.7	24
4	28.2	26.2	22.9	27.6	26.6	20.3	26.2	22.1	12.4	13.3	15.0	15.7	14.0	15.7	18.5	14.1	13.9	11.2	10.4	10.8	11.9	12.7	13.5	16.5	10.4	28.2	17.5	24
5	17.7	12.8	17.2	15.6	15.4	17.2	15.9	15.8	17.6	21.1	26.4	29.3	30.1	24.5	31.0	28.4	22.9	24.4	17.2	22.2	15.3	16.5	15.8	17.0	12.8	31.0	20.3	24
6	18.0	18.7	20.5	19.2	19.3	20.9	20.8	20.8	27.2	26.8	29.5	28.4	27.8	19.5	15.8	22.5	22.9	18.3	15.6	16.7	16.3	17.0	14.8	19.4	14.8	29.5	20.7	24
7	15.6	16.2	11.9	13.2	14.3	13.9	7.7	7.9	12.8	11.3	12.4	13.3	11.5	15.7	15.5	16.0	15.3	17.4	15.4	14.6	15.9	17.4	14.1	13.5	7.7	17.4	13.9	24
8	13.2	15.6	14.8	15.0	15.2	11.7	13.4	20.7	18.9	22.7	23.6	21.2	21.2	19.7	20.1	24.3	18.5	21.2	21.5	21.1	30.8	28.4	29.7	28.1	11.7	30.8	20.4	24
9	25.5	28.2	24.5	26.4	22.5	24.6	25.0	17.7	19.2	21.1	12.4	12.4	16.6	17.2	27.1	28.8	17.4	15.2	15.2	9.5	15.9	19.8	20.7	17.2	9.5	28.8	20.0	24
10	18.5	17.7	19.0	15.9	13.2	13.7	13.0	13.4	13.4	13.8	14.3	17.5	21.0	27.6	37.0	32.2	24.7	18.4	15.7	15.0	15.4	11.1	10.7	12.2	10.7	37.0	17.7	24
11	10.9	14.1	12.4	11.3	10.9	9.6	8.5	11.8	10.0	7.0	11.2	11.8	15.8	9.4	17.5	15.3	14.7	13.4	13.1	14.0	15.8	23.2	18.8	15.9	7.0	23.2	13.2	24
12	17.9	15.7	17.9	19.8	20.0	24.4	24.2	22.2	26.0	24.5	25.2	22.5	27.4	28.5	26.9	24.7	26.0	18.4	18.1	26.9	29.1	28.4	29.1	25.1	15.7	29.1	23.7	24
13	24.4	23.2	18.8	21.5	20.7	19.6	19.4	18.3	17.9	18.4	16.0	15.4	14.2	11.7	14.0	14.5	14.2	14.0	13.9	17.7	22.7	23.9	22.3	16.4	11.7	24.4	18.0	24
14	22.7	24.7	28.2	33.6	37.1	38.2	29.3	27.5	29.8	35.2	37.9	39.6	47.5	41.0	42.1	45.6	50.4	46.0	38.7	33.9	39.6	40.1	35.4	34.6	22.7	50.4	36.6	24
15	34.4	37.9	37.2	31.1	26.9	24.9	26.2	23.1	24.7	29.1	32.6	26.5	25.6	25.4	20.8	21.1	24.2	24.1	26.9	46.1	41.4	35.9	34.8	32.8	20.8	46.1	29.7	24
16	24.7	22.7	19.0	21.6	15.7	13.9	16.6	13.5	13.3	15.9	16.8	14.4	12.5	20.3	21.9	14.7	15.8	17.5	12.9	4.8	8.5	8.3	8.1	14.2	4.8	24.7	15.3	24
17	13.5	11.5	10.4	11.8	15.9	14.0	11.9	14.0	12.4	16.9	11.6	13.1	19.0	17.3	20.2	13.4	9.9	12.2	10.0	11.5	10.2	12.4	24.3	21.5	9.9	24.3	14.1	24
18	26.3	28.3	21.5	24.1	23.4	22.3	20.1	22.3	25.6	23.4	29.7	26.4	37.2	27.4	22.5	25.6	18.2	17.9	12.8	14.8	15.3	15.7	14.6	14.0	12.8	37.2	22.1	24
19	10.5	15.7	12.7	15.9	14.6	13.1	10.6	11.1	13.3	14.6	15.5	17.1	25.8	25.8	28.5	28.8	25.8	23.4	20.3	21.0	25.6	24.7	23.3	26.9	10.5	28.8	19.4	24
20	24.3	24.7	30.6	21.6	25.5	18.1	16.1	14.6	13.7	9.8	9.5	12.3	12.7	14.9	13.9	18.0	23.4	22.1	13.8	14.0	12.5	12.9	15.1	12.7	9.5	30.6	17.0	24
21	10.1	10.9	9.4	12.5	11.6	14.0	21.0	33.0	40.0	34.3	43.8	40.3	44.7	44.5	37.6	33.8	38.6	36.1	40.3	40.3	43.0	44.5	47.5	53.0	9.4	53.0	32.7	24
22	42.0	45.3	54.5	50.1	49.5	50.3	44.0	47.7	48.5	50.8	49.9	56.0	55.7	68.1	61.3	68.5	53.6	51.4	50.5	59.6	54.9	64.2	60.6	69.4	42.0	69.4	54.4	24
23	67.4	72.7	74.2	62.6	67.2	74.8	67.1	59.9	57.9	59.2	44.1	52.0	46.2	40.7	31.5	21.0	18.0	14.7	12.0	13.3	16.8	21.9	20.4	27.4	12.0	74.8	43.5	24
24	27.8	37.5	30.7	32.6	33.1	26.1	17.9	15.6	24.5	32.2	25.8	20.2	20.2	21.3	27.9	30.5	31.3	25.5	28.1	20.4	18.9	18.6	23.9	10.8	10.8	37.5	25.1	24
25	11.0	13.0	19.9	21.4	17.3	22.3	20.1	16.2	22.3	23.6	16.4	15.4	24.7	21.3	20.8	19.1	13.4	7.8	14.2	13.3	12.4	13.8	18.3	23.2	7.8	24.7	17.6	24
26	21.0	22.5	30.2	27.3	26.0	30.6	24.4	25.9	22.3	20.3	20.8	17.1	11.6	17.1	28.9	30.5	48.8	40.0	34.9	38.0	36.7	33.0	32.9	26.0	11.6	48.8	27.8	24
27	34.3	32.2	29.1	27.8	29.7	33.0	47.2	41.5	43.5	55.5	56.0	44.6	42.4	33.0	25.4	17.4	18.5	20.5	24.2	20.0	20.5	24.6	22.5	14.4	14.4	56.0	31.6	24
28	17.6	15.4	17.6	18.8	17.8	18.3	20.0	15.6	21.8	30.0	33.3	28.7	29.8	33.3	26.7	27.8	33.9	27.1	24.2	21.4	18.1	19.0	32.0	44.2	15.4	44.2	24.7	24
29	42.9	40.2	30.6	22.0	18.7	22.3	23.1	25.7	22.3	23.3	18.1	16.8	15.1	P	22.0	20.7	21.6	20.2	23.0	20.8	21.9	20.6	19.7	19.8	15.1	42.9	23.1	23
30	20.9	20.9	20.4	19.6	19.7	19.1	13.6	12.6	19.1	28.1	30.8	32.7	32.1	36.0	44.5	36.2	41.2	48.2	31.2	25.6	19.1	21.1	22.6	21.9	12.6	48.2	26.6	24
31	18.2	19.3	23.4	26.9	27.4	27.2	26.1	28.8	29.9	29.6	45.4	42.2	36.0	47.8	53.7	52.9	49.5	50.9	44.9	33.1	27.9	24.1	29.4	25.2	18.2	53.7	34.2	24
HOURLY MAX	67.4	72.7	74.2	62.6	67.2	74.8	67.1	59.9	66.4	62.9	60.1	61.7	57.7	68.1	61.3	68.5	53.6	51.4	59.4	60.2	55.3	64.2	60.6	69.4				
HOURLY AVG	24.8	25.8	25.9	26.0	25.5	25.7	24.7	24.6	26.5	28.1	28.7	28.1	28.9	29.0	29.5	29.1	27.8	26.1	23.9	24.4	25.0	25.7	26.5	25.9				

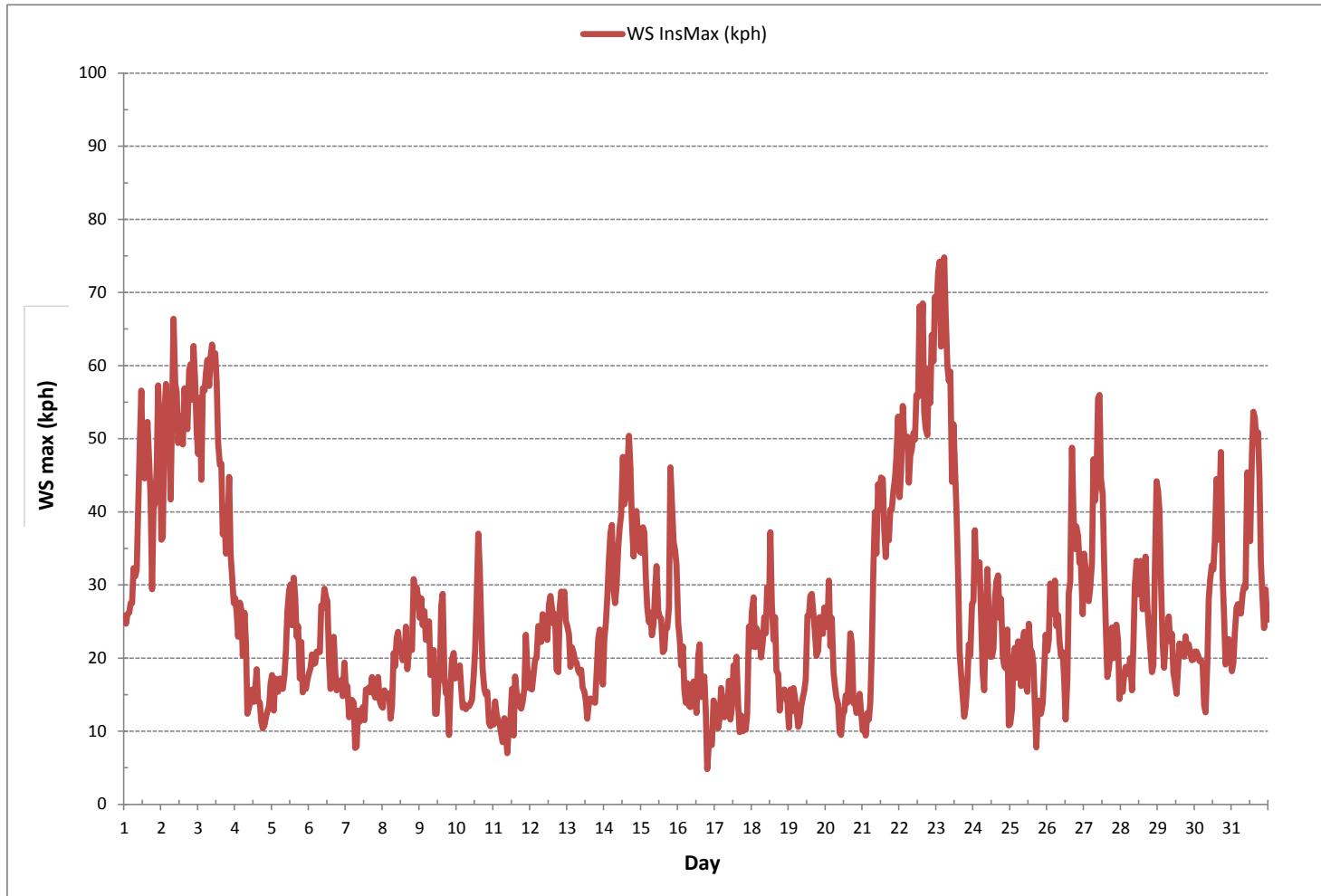
STATUS FLAG CODES

C	- MONTHLY CALIBRATION	Q	- QUALITY ASSURANCE
C1	- REPEAT CALIBRATION	R	- RECOVERY
Y	- MAINTENANCE	X	- MACHINE MALFUNCTION
S	- DAILY ZERO/SPAN CHECK	G	- OUT FOR REPAIR
S1	- REPEAT ZERO/SPAN CHECK	P	- POWER FAILURE

MONTHLY SUMMARY

MAXIMUM INSTANTANEOUS VALUE:	74.8	kph	@ HOUR	5	ON DAY	23	
OPERATIONAL TIME:						743	hrs

WIND SPEED Instantaneous Maximum (WS kph)



APPENDIX V
REPORT CERTIFICATION FORM

Report Certification Form

Alberta Airshed (if applicable)	EPA Approval or Code of Practice Registration # (if applicable)
YES	NA
Company Name (if applicable)	Industrial Operation Name (if applicable)
Lakeland Industry & Community Association	St. Lina Continuous Monitoring Station
Name of the Representative of the Person Responsible	Position / Title of the Representative of the Person Responsible
Mike Bisaga	Environment Monitoring Program Manager
Is an External Party Certifying the Report?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Name of External Person Certifying the Report	Position / Title of External Person Certifying the Report
Wunmi Adekanmbi	Project Manager, Customer Service, Air Services
Company Name for the External Person Certifying the Report	Identification of Qualifications / Professional Designations of the External Person Certifying the Report
Maxxam Analytics, A Bureau Veritas Group Company	M.Sc., EPT, PMP

Maxxam Analytics is the designated contractor conducting monitoring and reporting activities. I certify that the submitted data has been (a) reviewed and validated as per the AMD Chapter 6: Ambient Data Quality. I certify that the submitted report (b) accurately reflects the monitoring results and reporting timeframe and (c) meets the specified analysis, summarization and reporting requirements as per the AMD Chapter 9: Reporting.



 Signature of the Representative of the Person Responsible / External Person Certifying the Report

27-April-2018

 Report Issued Date (dd-mm-yyyy)

APPENDIX VI
DATA VALIDATION CERTIFICATION FORM



Validation Certificate Form

Client: <u>Lakeland Industry & Community Association</u>	Project #: <u>2833-2018-03-31-C</u>
Site: <u>St. Lina Continuous Monitoring Station</u>	Contact: <u>Mike Bisaga</u>

Level 0 Preliminary Verification	<u>Maram Ghaleb</u>	Date <u>24-April-2018</u>
Level 1 Primary Validation	<u>Maram Ghaleb</u>	Date <u>24-April-2018</u>
Level 2 Final Validation	<u>Maram Ghaleb</u>	Date <u>26-April-2018</u>
Level 3 Independent Data Review	<u>CSA-Lmhq</u>	Date <u>27-April-2018</u>
Post-Final Validation	<u>NA</u>	Date <u>NA</u>

Notes
The Post-Final Validation step serves to re-evaluate the data that errors or omissions are discovered and/or suspected after the initial submittal of data. This validation is performed on an annual basis.